VOLUME 22 PART 1

NORTH AMERICAN FLORA

ROSALES

JOHN KUNKEL SMALL

PODOSTEMONACEAE

GEORGE VALENTINE NASH

CRASSULACEAE

NATHANIEL LORD BRITTON, JOSEPH NELSON ROSE

PENTHORACEAE, PARNASSIACEAE

PER AXEL RYDBERG

PUBLISHED BY
THE NEW YORK BOTANICAL GARDEN
MAY 22, 1905

Order **ROSALES**

By John Kunkel Small

Herbs, shrubs, trees or vines, rarely aquatics (*Podostemonaceae*), the plants sometimes armed with prickles or thorns. Leaves alternate, opposite or whorled; blades simple and entire, toothed, incised or parted, or compound. Flowers predominantly perfect, sometimes monoecious, dioecious or polygamous, regular, or typically irregular in *Caesalpiniaceae*, *Krameriaceae* and *Fabaceae*, borne in open or congested clusters, the floral envelopes borne on the margin of the manifest or well developed hypanthium, or rarely on the torus below the gynoecium. Calyx of distinct or partially united sepals, regular, or decidedly irregular (*Krameriaceae* and *Caesalpiniaceae*) or sometimes 2-lipped (*Fabaceae*), or rarely wanting (*Altingiaceae*). Corolla of as many distinct petals as there are sepals and regular or irregular, or of partially united petals (*Caesalpiniaceae* and *Krameriaceae*), or papilionaceous and with the keel-petals mostly united (*Fabaceae*), or rarely wanting (*Podostemonaceae*, *Altingiaceae*, some *Crassulaceae*, *Saxifragaceae*, *Hamamelidaceae*, *Rosaceae* and *Fabaceae*). Androecium of as many stamens as there are sepals or petals, or twice as many or more, borne on the margin of the hypanthium or rarely on the torus below the gynoecium, sometimes partially reduced to staminodia; filaments distinct or partially united, sometimes monodelphous or diadelphous; anthers short or elongated, straight or bent, sometimes with glandular appendages. Gynoecium of a single carpel or of several distinct or united carpels, sessile or stipitate. Ovary superior or partially or wholly inferior; style terminal, lateral or basal; stigma minute or inconspicuous. Ovules solitary, few or many in each carpel, variously borne. Fruit a follicle, legume, loment, capsule, pyxis, achene, drupe, pome, or berry, sometimes aggregate. Seed with or without endosperm, sometimes arillate.

Aquatic alga-like fleshy herbs, usually with spathe-like involucres.	Fam. 1. Podostemonaceae.
Terrestrial or swamp plants, without spathe-like involucres.	
Flowers regular or nearly so (actinomorphic).	
Endosperm present, usually copious and fleshy: stipules mostly wanting.	
Herbs.	
Carpels as many as the sepals: stamens as many as the sepals or twice as many.	
Plants succulent: carpels distinct or united at the base, opening lengthwise.	Fam. 2. Crassulaceae.
Plants not succulent: carpels united to the middle, circumscissile.	Fam. 3. Penthoraceae.
Carpels fewer than the sepals.	
Staminodia present: carpels 3 or 4, wholly united into a 1-celled gynoecium.	Fam. 4. Parnassiaceae.
Staminodia wanting: carpels mostly 2, distinct or partially united.	Fam. 5. Saxifragaceae.
Shrubs or trees.	
Leaves opposite.	
Leaves without stipules: gynoecium not surrounded by a disk.	Fam. 6. Hydrangeaceae.
Leaves with stipules: gynoecium surrounded by an annular or a lobed disk.	Fam. 7. Cunoniaceae.
Leaves alternate.	
Fruit a 2–5-celled capsule, or of more or less united follicles.	

Capsule thin-walled, almost free from the hypanthium.
Stamens 5: hypanthium flattish, not accrescent: leaves without stipules. Fam. 8. ITEACEAE.
Stamens numerous: hypanthium hemispheric, inflated in age: leaves with stipules. *Opulaster* in Fam. 18. ROSACEAE.
Capsule woody or thick-walled, manifestly adnate to the hypanthium.
Styles united. Fam. 9. PTEROSTEMONACEAE.
Styles distinct.
Calyx or calyx and corolla present: ovule solitary in each carpel, suspended. Fam. 10. HAMAMELIDACEAE.
Calyx and corolla wanting: ovules several or numerous in each carpel, horizontal. Fam. 11. ALTINGIACEAE.
Fruit a 1-celled berry.
Hypanthium not produced beyond the top of the ovary; flower-clusters borne on the leaf-blades. Fam. 12. PHYLLONOMACEAE.
Hypanthium produced beyond the top of the ovary; flowers axillary. Fam. 13. GROSSULARIACEAE.
Endosperm wanting or scant: stipules mostly present.
Flowers monoecious, in dense capitate clusters. Fam. 14. PLATANACEAE.
Flowers perfect, or if monoecious or dioecious, not in capitate clusters.
Seed with a fimbriate or rugose aril,
Carpels bearing several or many ovules: leaves with simple blades. Fam. 15. CROSSOSOMATACEAE.
Carpels bearing 1 or 2 ovules: leaves with compound blades. Fam. 16. CONNARACEAE.
Seed without an aril.
Carpels several or numerous, or if solitary becoming an achene.
Carpels distinct, rarely adnate to the hypanthium: fruit achenes, follicles or drupelets.
Sepals and petals numerous: leaves opposite. Fam. 17. CALYCANTHACEAE.
Sepals and petals 5 or fewer, or petals rarely wanting: leaves mostly alternate. Fam. 18. ROSACEAE.
Carpels united, enclosed by the hypanthium and adnate to it: fruit a pome. Fam. 19. MALACEAE.
Carpel solitary, not becoming an achene.
Ovary bearing 2 ovules: leaf-blades simple: fruit a drupe. Fam. 20. AMYGDALACEAE.
Ovary bearing several ovules: leaf-blades 2–3-pinnate: fruit a legume.
Petals valvate in the bud. Fam. 21. MIMOSACEAE.
Petals imbricate in the bud. Genera in Fam. 23. CAESALPINIACEAE.
Flowers irregular (mainly zygomorphic).
Upper petal enclosed by the lateral ones in the bud: corolla not papilionaceous,
Fruit indehiscent, armed with barbed spines: leaf-blades simple: stipules wanting. Fam. 22. KRAMERIACEAE.
Fruit a legume or loment: leaf-blades compound: stipules usually present. Fam. 23. CAESALPINIACEAE.
Upper petal enclosing the lateral ones in the bud: corolla papilionaceous. Fam. 24. FABACEAE.

for A. J. Rendich.
Escallonia
Dunnell-Smith,

Parcum. Willelmum 1643.

Family 1. **PODOSTEMONACEAE**

By George Valentine Nash

Immersed aquatic annual or perennial herbs, usually strongly adhering to rocks and creeping upon them, with branching or disc-like rhizomes and usually fleshy stems; leaves of various form, ranging from flat and fucus-like and more or less lobed to decompound, and flowers variously disposed. Flowers perfect, naked or at first enclosed in a spathe which is later disrupted by the elongating pedicel and remains at its base. Perianth wanting, or reduced to a few minute scales, or large and membranous and 3-toothed or 5-parted. Stamens hypogynous, 1–many, when many the filaments free in complete or incomplete whorls, or more or less united at the base; anthers of two parallel cells. Ovary sessile or stipitate, free, usually 2–3-celled. Styles 1–3, distinct, or shortly connate at the base, linear to leaf-like. Ovules numerous, attached to central or parietal placentae. Capsule 2–3-celled, dehiscing septicidally, or sometimes 1-celled, the valves usually with evident nerves, two, equal or unequal, or three and equal. Seeds numerous, sessile; endosperm wanting.

Flowers with perianth; stamen 1; spathe wanting. 1. Tristicha.
Flowers without perianth or perianth rudimentary; spathe present.
  Valves of the capsule equal; stamens free.
    Stamens usually many, in a complete whorl. 2. Marathrum.
    Stamens usually few, in an incomplete whorl. 3. Blandowia.
  Valves of the capsule unequal.
    Stamens 2, united below. 4. Podostemon.
    Stamen 1. 5. Oserya.

1. **TRISTICHA** Thouars (Nov. Gen. Madag. 3. 1806, hyponym); Spreng. Syst. Veg. 1: 22. 1825.

Dufourea Bory; Willd. Sp. Pl. 5: 55. 1810. Not *Dufourea* Ach. 1810.
Philocrena Bong. Mem. Acad. St. Petersb. VI. 1: 80. *pl. 6.* 1832.
Potamobryon Liebm. Forh. Skand. Nat. Kiob. 1849: 512. 1849.

Moss-like submersed aquatic herbs, with short and densely tufted or elongated much-branched stems, small sessile crowded 3-ranked leaves, and flowers usually in pairs at the ends of the short branches. Perianth thin-membranous, 3-lobed, the lobes slightly imbricated. Stamen 1; filament filiform. Ovary 3-celled; placenta central. Styles 3, linear, short, erect. Capsule septicidally 3-valved, the valves 3-nerved, equal.

Type species, *Tristicha alternifolia* Thouars.

1. **Tristicha hypnoides** (St. Hil.) Spreng. Syst. Veg. 4²: 10. 1827.

Dufourea hypnoides St. Hil. Mem. Mus. Paris 10: 472. 1823.
Potamobryon concinnum Liebm. Forh. Skand. Nat. Kiob. 1849: 513. 1849.
Potamobryon laxum Liebm. Forh. Skand. Nat. Kiob. 1849: 514. 1849.
Potamobryon patulum Liebm. Forh. Skand. Nat. Kiob. 1849: 515. 1849.

A tufted or creeping leafy-stemmed branching aquatic. Stems usually less than 1 dm. long, commonly but 2–3 cm.; leaves from elliptic to broadly ovate, obtuse, entire, generally tristichously arranged, usually crowded, 0.75–2 mm. long; pedicel 3–15 mm. long; perianth-parts oblong-elliptic; capsule ellipsoid, about 1 mm. long.

Type locality: Brazil.
Distribution: Vera Cruz and Guatemala to Colombia, Guiana, Brazil and Cuba.
Illustrations: Arch. Mus. Hist. Nat. 6: *pl. 10, f. 4*; Mart. Fl. Bras. 4¹: *pl. 75, f. 5*; Vidensk. Selsk. Skr. VI. Nat. og Mat. 9: 108–113, *f. 1–6*, and 11: 25–28, *f. 20–23*.

2. **MARATHRUM** H. & B. Pl. Aequin. 1: 39. 1806.

Aquatic submersed herbs with a thickened disc-like or short dichotomously branched rhizome, leaf-blades which vary from broad, flat and more or less lobed, to decompound, and solitary flowers. Flowers at first concealed in a spathe; this is finally irregularly disrupted by the growing pedicel, which attains sometimes a length of several centimeters. Perianth rudimentary. Stamens 5–25, in a complete whorl. Ovary 2-celled. Styles 2, free or somewhat united at the base. Capsule of 2 equal nervose valves, dehiscent.

Type species, *Marathrum foeniculaceum* H. & B.

Pedicel abruptly enlarged at the apex, forming a broad bowl-shaped hypanthium.
- Capsule with the nerves prominent; leaves with the divisions usually erect or erect-ascending. — 1. *M. foeniculaceum.*
- Capsule with the nerves not prominent; leaves with the divisions spreading or ascending, resembling those of *Achillea Millefolium.* — 2. *M. Schiedeanum.*

Pedicel barely if at all enlarged at the apex.
- Capsule less than 3 mm. long.
  - Pedicel less than 1 cm. long; leaves often 2 dm. long. — 3. *M. cubanum.*
  - Pedicel 1.5–3.5 cm. long; leaves 6 cm. long or less. — 4. *M. modestum.*
- Capsule 4–5 mm. long. — 5. *M. oxycarpum.*

1. **Marathrum foeniculaceum** H. & B. Pl. Aequin. 1: 40. 1806.

Lacis foeniculacea Mart. Nov. Gen. 1: 6. 1823.

Rhizome somewhat fleshy, disc-like and more or less lobed. Leaves 1.5–2.5 dm. long, the blade 3–4-pinnatifid, the ultimate divisions filiform; pedicel, when mature, 1–4 cm. long, abruptly thickened into a broad bowl-shaped hypanthium about 2 mm. broad; stamens 5–8, the filaments linear, varying from shorter than the capsule to longer; capsule ellipsoid, acutish, about 4 mm. long, prominently 8-nerved, short-stipitate.

TYPE LOCALITY: Salto de Tequendama, New Granada.
DISTRIBUTION: Mexico (*fide* Hemsley), Panama and Colombia.
ILLUSTRATIONS: Humb. & Bonpl. Pl. Aequin. 1: *pl. 11;* Lam. Encyc. Ill. 4: *pl. 941;* Dict. Sci. Nat. *pl. 42;* Schnitzl. Icon. *pl. 85, f. 24;* Vidensk. Selsk. Skr. VI. Nat. og Mat. 11: 51. *f. 47.*

2. **Marathrum Schiedeanum** Cham. Linnaea 9: 504. 1835.

Lacis foeniculacea Schlecht. & Cham. Linnaea 6: 42, excl. syn. 1831.
Lacis Schiedeana Cham. Linnaea 9: 504. 1835.
Marathrum flexuosum Liebm. Forh. Skand. Nat. Kiob. 1849: 511. 1849.
Marathrum tenue Liebm. Forh. Skand. Nat. Kiob. 1849: 511. 1849.

Rhizome creeping, thick, elongated. Leaves 4 dm. long or less and 2–4 cm. broad, the petiole 1.5–14 cm. long, the blade with the divisions spreading or ascending, 4-pinnatifid, the ultimate divisions linear; pedicel, when mature, 2–8 cm. long, straw-colored, rather abruptly enlarged at the apex into a bowl-shaped hypanthium 1.5–2.5 mm. broad; stamens 6–8, the filaments subulate or narrowly linear, from a little shorter than the capsule to somewhat exceeding it; capsule ellipsoid, obtuse, about 5 mm. long, obscurely 8-nerved.

TYPE LOCALITY: Rio de Actopan near Actopan, Mexico.
DISTRIBUTION: Mexico, Guatemala and Colombia.
ILLUSTRATIONS: Linnaea 9: *pl. 6*, as *Lacis Schiedeana;* Schnitzl. Icon. *pl. 85, f. 3;* Vidensk. Selsk. Skr. VI. Nat. og Mat. 11: 40, 41, *f. 35, 36* and 46, 47, *f. 43–45.*

3. **Marathrum cubanum** Wright, in Sauv. Anal. Acad. Cienc. Habana 7: 561. 1871.

Rhizome fleshy, rather short. Leaves 2.5 dm. long or less, 2–5 cm. wide, the petiole commonly 4–5 cm. long, fleshy, the blade usually less than 2 dm. long, 3–4-pinnatifid, the ultimate divisions about 1 mm. long or less, linear, acute or sometimes obtuse; pedicel less than 1 cm. long and not at all, or but very little, enlarged at the apex; stamens 5–7, the filaments subulate, a little shorter than to somewhat exceeding the capsule; capsule ellipsoid, 2.3–2.8 mm. long, obtuse.

TYPE LOCALITY: Sebastian River, Pinar del Rio, Cuba.
DISTRIBUTION: Cuba.

4. **Marathrum modestum** (Wedd.) Nash.

Marathrum Schiedeanum modestum Wedd. in DC. Prodr. 17: 54. 1873.

A small plant. Rhizome disc-like, lobed: leaves 2.5–6 cm. long, the petiole 5–15 mm. long, rather slender, the blade 2–3.5 cm. long, the rachis rather narrow, 4-pinnatifid, the

Costa Rica

ultimate segments less than 1 mm. long, usually obtuse; spathe 1 cm. long or less; pedicel, when mature, 1.5–3.5 cm. long, rather slender, not at all or barely enlarged at the apex; stamens 6–8, when mature about 3 mm. long and usually considerably exceeding the capsule, the anthers about 1 mm. long; capsule, when mature, 2.25–2.5 mm. long, about 1.5 mm. in diameter, oval, obtuse, the nerves less prominent than in *M. oxycarpum* Tul.; stigmas partly united at the base, 1.2–1.5 mm. long, obtuse.

TYPE LOCALITY: Not cited.
DISTRIBUTION: Nicaragua and Guatemala.
ILLUSTRATION: Vidensk. Selsk. Skr. VI. Nat. og Mat. 11: *42, f. 38*, and *50, f. 46*.

5. **Marathrum oxycarpum** Tul. Ann. Sci. Nat. III. **11**: 94. 1849.

Rhizome thick, variable. Leaves 4 dm. long or less, the petiole less than 1 dm. long, fleshy, the blade 3 dm. long or less, the midrib weak, 4–5-pinnatifid, the ultimate divisions filiform and usually more than 3 mm. long; pedicel, when mature, 4–9 cm. long, straw-colored, rather stout, slightly if at all enlarged at the apex; stamens 8–10; filaments subulate, a little shorter than the capsule; capsule 4–5 mm. long, less than 2 mm. broad, ellipsoid, acute, the 8 ribs very manifest, the stigmas partly united at the base and 2.5–3 mm. long.

TYPE LOCALITY: Tropical America.
DISTRIBUTION: Guatemala, Nicaragua and Panama.

UNCERTAIN SPECIES

Marathrum? ricciaeforme Liebm. Forh. Skand. Nat. Kiob. 1849: 512. 1849. Liebmann remarks (*l. c.*) that the material upon which he based this species was secured at Huitamalco, Vera Cruz, Mexico, and that, as it was without flowers or fruit, it could not be accurately described; but that for the purpose of calling attention to this form, he gives a description of it. Warming (Vidensk. Selsk. Skr. VI. Nat. og Mat. 11: 49. 1901) disposes of the species by saying that it is not a *Marathrum*, but rather a *Podostemon*.

3. **BLANDOWIA** Willd. Ges. Naturf. Fr. Berl. Mag. 3: 100. 1809.

Apinagia Tul. Ann. Sci. Nat. III. 11: 97. 1849.
Monostylis Tul. Arch. Mus. Hist. Nat. 6: 201. 1852.
Neolacis Wedd. in DC. Prodr. 17: 59. 1873.

Aquatic submerged herbs with erect or creeping dichotomously branched leafy or leafless stems, leaves of various form, and flowers borne singly in the forks, or singly or in fascicles along the stem. Flowers with a rudimentary perianth, at first concealed in a spathe which is at length disrupted by the growing pedicel. Stamens 2–6, in an incomplete whorl; filaments free, flattened. Ovary 2-celled. Styles 2, free or somewhat united below. Capsule with 2 equal prominently nerved valves.

Type species, *Blandowia striata* Willd.

1. **Blandowia myriophylla** (Wedd.) Nash.

Neolacis myriophylla Wedd. in DC. Prodr. 17: 63. 1873.

Rhizome short. Leaves up to 11 cm. long, the petiole 3 cm. long or less, thick, abruptly dilated into a broad clasping base; blade 8 cm. long or less, the rachis rather thick and fleshy, tripinnatifid, the ultimate segments filiform and reaching 2 mm. in length; spathe 8–13 mm. long, loose, dilated above and irregularly 2–5-toothed at the apex; pedicel, when mature, 1–4 cm. long, not at all or barely dilated at the apex; stamens 2 or 3, from slightly shorter than the capsule to a little exceeding it; capsule 2.5–3 mm. long, the stigmas about 1 mm. long, acute.

TYPE LOCALITY: Rio Virillo, Costa Rica.
DISTRIBUTION: Mexico and Costa Rica.

4. **PODOSTEMON** Michx. Fl. Bor. Am. **2**: 164. 1803.

Aquatic herbs with branching stems, distichous filiform leaves with entire or dichotomously dissected blades, and terminal or axillary solitary flowers. Flowers with a rudimentary perianth, at first enclosed in a spathe which is finally disrupted by the growing pedicel. Stamens 2, united below. Ovary 2-celled. Stigmas 2, linear. Capsule 2-celled,

2-valved, the valves unequal and 5-nerved, the one deciduous with the placenta and seeds, the other persistent.

Flowers single or scattered : stems usually less than 1 dm. long : leaves short and narrow. 1. *P. Ceratophyllum.*
Flowers clustered at the end of the stem : stems usually more than 2 dm. long, sometimes reaching 8 dm.: leaves long and filiform. 2. *P. abrotanoides.*

Type species, *Podostemon Ceratophyllum* Michx.

1. **Podostemon Ceratophyllum** Michx. Fl. Bor. Am. **2**: 165. 1803.

Lacis ceratophylla Bong. Mem. Acad. Petersb. VI. 3^2: 78. 1835.

Stems less than 2 dm. long, usually but a few centimeters, simple or somewhat branched. Leaves very narrow, entire or dichotomously dissected; pedicel less than 1 cm. long; flowers single or scattered; capsule 2.5–3 mm. long, ellipsoid, obtuse.

TYPE LOCALITY : Ohio River, near Louisville.
DISTRIBUTION : Maine to Ontario, Kentucky, Georgia and Alabama.
ILLUSTRATIONS : Michx. Fl. Bor. Am. **2**: *pl. 44*; Britt. & Brown, Ill. Fl. *f. 1808*; Torr. Fl. N. Y. *pl. 98*; Schnitzl. Icon. *pl. 85, f. 8–22*; Vidensk. Selsk. Skr. VI. Nat. og Mat. **2**: *pl. 1–3, pl. 4, f. 1–13, pl. 7*; Hook. Comp. Bot. Mag. **2**: *pl. 20.*

2. **Podostemon abrotanoides** Nutt. Jour. Acad. Phila. **7**: 105. 1834.

Stems commonly 2–8 dm. long, more branched than in the preceding. Leaves finely dissected, the ultimate divisions long and filiform; flowers clustered at the end of the stem or branches; capsule 2.5–3 mm. long, ellipsoid.

TYPE LOCALITY : Chattahoochee River, Georgia.
DISTRIBUTION : Georgia and Florida to Mississippi.

5. **OSERYA** Tul. & Wedd. Ann. Sci. Nat. III. **11**: 105. 1849.

Small aquatic plants creeping on inundated rocks, with a simple or branched rhizome, distichous simple or dissected leaves, and usually terminal solitary flowers. Flowers with a rudimentary perianth, at first enclosed in a spathe which is finally disrupted by the pedicel. Stamen 1; filament flattened. Ovary obliquely sessile, 2-celled. Stigmas 2, erect, free, very short. Capsule of 2 unequal nerved valves, the larger persistent, the smaller deciduous.

Type species, *Oserya flabellifera* Tul. & Wedd.

1. **Oserya Coulteriana** Tul. Ann. Sci. Nat. III. **11**: 106. 1849.

Rhizome flabelliform, the stems 2–3 cm. long, simple or dichotomously branched. Leaves 3–6 cm. long, the blade dichotomously dissected, the divisions very narrow; flowers solitary, usually at the summit of the stem, rarely from the axils or from the rhizome itself; stamen 1; ovary smooth or sometimes inconspicuously striate; mature capsule unknown.

TYPE LOCALITY : San Blas to Guadalajara, Mexico.
DISTRIBUTION : Mexico.

Family 2. CRASSULACEAE

By Nathaniel Lord Britton and Joseph Nelson Rose[1]

Herbs, or somewhat shrubby plants, mostly fleshy or succulent, with cymose, or rarely racemose or solitary, regular, symmetrical, mostly perfect flowers. Stipules none. Calyx persistent, free from the ovary or ovaries, mostly 4–5-parted or 4–5-lobed. Petals equal in number to the calyx-segments, distinct, or more or less united, usually persistent, rarely wanting. Stamens of the same number or twice as many as the petals: anthers longitudinally dehiscent. Receptacle usually with a scale at the base of each carpel. Carpels equal in number to the sepals, distinct, or united below; styles subulate or filiform; ovules numerous, arranged in 2 rows along the ventral suture, rarely few, or solitary. Follicles 1-celled, dehiscent along the ventral suture. Seeds minute; endosperm fleshy; embryo terete; cotyledons short, obtuse.

Calyx inflated; leaves opposite and often compound. — 1. Bryophyllum.
Calyx not inflated; leaves always simple and rarely opposite.
  Stamens as many as the calyx-lobes.
    Flowers clustered; carpels 1 or 2-seeded. — 2. Tillaea.
    Flowers solitary; carpels several-seeded. — 3. Tillaeastrum.
  Stamens twice as many as the calyx-lobes.
    Petals 6 to 20. — 4. Sempervivum.
    Petals 5 or fewer.
      Carpels one-seeded; seed erect. — 5. Sedella.
      Carpels many-seeded; seeds horizontal.
        Petals usually appendaged at insertion of stamens. — 6. Pachyphytum.
        Petals not appendaged.
          Corolla strongly 5-angled. — 7. Echeveria.
          Corolla not strongly 5-angled.
            Flowers very large, solitary at the ends of slender branches. — 8. Oliveranthus.
            Flowers smaller, many, variously arranged.
              Flowers axillary, arranged in equilateral racemes, spikes or panicles.
                Leaves opposite, broad, concave on the face. — 9. Lenophyllum.
                Leaves alternate, narrow, flat or rounded on the face.
                  Calyx longer than the corolla. — 10. Corynephyllum.
                  Calyx shorter than the corolla.
                    Rootstock thick and woody; flowers large; petals distinct. — 11. Clementsia.
                    Rootstock wanting; flowers minute; petals united. — 12. Villadia.
              Flowers terminal, arranged in one-sided racemes or cymes.
                Petals more or less united.
                  Calyx minute. — 13. Urbinia.
                  Calyx conspicuous.
                    Flowers in a dense spike. — 14. Courantia.
                    Flowers in cymes or panicles.
                      Corolla tubular; lobes long and erect. — 15. Dudleya.
                      Corolla short-campanulate to rotate; lobes spreading.
                        Leaves flat, spatulate and obtuse. — 16. Gormania.
                        Leaves terete, acute.
                          Carpels distinct, erect; Mexican plateau plants. — 17. Altamiranoa.
                          Carpels united at base, spreading; Pacific Coast plants.
                            Plants with a woody usually branching rootstock. — 18. Stylophyllum.

[1] Permission has been given by the Secretary of the Smithsonian Institution for Dr. Rose to contribute to this monograph.

Plants with small corms. 19. HASSEANTHUS.
Petals distinct.
Petals hooded. 20. DIAMORPHA.
Petals not hooded.
Carpels erect.
Flowers yellow, arranged in panicles. 21. CREMNOPHILA.
Flowers never arranged in panicles.
Flowers not white, often polygamous. 22. RHODIOLA.
Flowers white, perfect; Mexican species. 23. SEDASTRUM.
Carpels usually spreading: flowers perfect.
Annuals; carpels 4; calyx-lobes broader than long; styles minute. 24. TETRORUM.
Perennials (mostly); carpels generally 5; sepals longer than broad; styles slender. 25. SEDUM.

1. BRYOPHYLLUM Salisb. Par. Lond. *pl. 3.* 1805.

Crassuvia Lam. Encycl. 2: 141, as synonym. 1786.

Erect fleshy perennial herbs, with opposite simple or pinnately compound leaves. Flowers perfect, nodding, in cymes or panicles opposite the branches. Sepals 4, united into an inflated calyx. Corolla subcampanulate to urceolate, the limb with 4 spreading lobes. Stamens 8, in two series, adnate to the corolla-tube; filaments filiform. Disk with 4 oblong glands. Carpels 4, distinct or partly united. Ovules numerous. Follicles 4.

Type species, *Bryophyllum calycinum* Salisb.

1. Bryophyllum pinnatum (Lam.) Kurz, Jour. Asiatic Soc. Bengal 40[2]: 52. 1871.

Cotyledon pinnata Lam. Encycl. 2: 141. 1786.
Bryophyllum calycinum Salisb. Par. Lond. *pl. 3.* 1805.

Glabrous, stem branched, 4–15 dm. tall. Leaves 1–3 dm. long, often pinnately compound, the leaflets oblong to elliptic, thick, obtuse, crenate, the terminal one much larger than the lateral ones; panicles 1–4 dm. long, many-flowered; calyx becoming oblong-campanulate, 3–3.5 cm. long, veiny; corolla reddish, longer than the calyx, its lobes lanceolate to ovate-lanceolate, acute.

TYPE LOCALITY: Molucca Islands.
DISTRIBUTION: Bermuda; Florida; throughout the West Indies and tropical America. Naturalized from Asia.
ILLUSTRATIONS: Salisb. *loc. cit.*; Bot. Mag. *pl. 1409*; Lodd. Bot. Cab. *pl. 877.*

2. TILLAEA (Micheli) L. Sp. Pl. 128. 1753.

Minute glabrous annual herbs, with opposite entire leaves and very small axillary, clustered flowers. Calyx 3–5-parted. Petals 3–5, distinct, or united at the base. Carpels 3–5, distinct; styles short, subulate. Ovules usually few. Carpels 1–2-seeded.

Type species, *Tillaea muscosa* L.

Calyx-segments 1 mm. long. 1. *T. erecta.*
Calyx-segments 2 mm. long. 2. *T. connata.*

1. Tillaea erecta Hook. & Arn. Bot. Beech. Voy. 24. 1830.

Tillaea minima Miers; Hook. & Arn. in Hook. Bot. Misc. 3: 338. 1833.
Tillaea leptopetala Benth. Pl. Hartw. 310. 1849.
Tillaea minima subsimplex S. Wats. Bot. Calif. 1: 208. 1876.
Crassula minima Reiche, Fl. Chile 2: 369. 1898.

Tufted, branched, 8 cm. high or less, the branches erect or ascending. Leaves connate at base, ovate to oblong, acute, 1.5–3 mm. long; flowers in axillary bracted clusters; pedicels very short, or often filiform and as long as the leaves or longer; sepals mostly 4, ovate, acute, about 1 mm. long, somewhat longer than the narrowly lanceolate acuminate petals; seeds commonly solitary.

TYPE LOCALITY: Conception, Chile.
DISTRIBUTION: In sandy or rocky soil, Oregon to Lower California, and in Chile.

1a. ? Kalanchoe

Kalanchoe brasiliensis St. Hil.

Vicinity of La Plata, Co. Za (Vidal, 203).

also naturalized in gardens, St Thomas

2. **Tillaea connata** R. & P. Fl. Per. 1: 70. 1798.

Tillaea rubescens H.B.K. Nov. Gen. & Sp. 6: 43. 1823.

Branched, erect or prostrate, 2–9 cm. high. Leaves lanceolate, connate at the base, acute, 1–4 mm. long; flowers several in the axils or sometimes solitary, pedicelled, or sessile; calyx-segments oblong-lanceolate to ovate-lanceolate, sharply acuminate, 2 mm. long; petals similar to the calyx-segments but shorter; seeds 1 or 2.

TYPE LOCALITY: On rocks among mosses, Chancay, Peru.
DISTRIBUTION: Lower California; near City of Mexico; Ecuador to Peru.
ILLUSTRATION: R. & P. Fl. Per. *pl. 106, f. a.*

3. **TILLAEASTRUM** Britton, Bull. N. Y. Bot. Gard. 3: 1. 1903.

Bulliarda DC. Bull. Soc. Philom. 3[49]: 1. 1801. Not *Bulliarda* Neck. 1790.

Small or minute, glabrous, annual aquatic or uliginous herbs, with opposite entire leaves and very small axillary solitary flowers. Calyx-segments mostly 4, distinct. Petals usually 4, distinct, or united at the base. Carpels usually 4, distinct. Styles short. Ovules few to several. Carpels few-seeded to several-seeded.

Type species, *Tillaea aquatica* L.

Flowers sessile or nearly so, the peduncles little elongating in fruit.	
Leaves linear-oblong, 4–6 mm. long.	1. *T. aquaticum.*
Leaves narrowly linear, 8–12 mm. long.	2. *T. viride.*
Flowers peduncled, the peduncles at length as long as the leaves or longer.	
Leaves linear: species of the western United States and Mexico.	
Peduncles as long as the leaves or longer.	3. *T. Drummondii.*
Peduncles not longer than the leaves; Mexican species.	4. *T. Pringlei.*
Leaves oblong; species of northeastern North America and Europe.	5. *T. Vaillantii.*

1. **Tillaeastrum aquaticum** (L.) Britton, Bull. N. Y. Bot. Gard. 3: 1. 1903.

Tillaea aquatica L. Sp. Pl. 128. 1753.
Tillaea simplex Nutt. Jour. Acad. Phila. 1: 114. 1817.
Tillaea ascendens Eaton, Man. ed. 2. 465. 1818.
Bulliarda aquatica DC. Prodr. 3: 382. 1828.
Tillaea angustifolia Nutt.; T. & G. Fl. N. Am. 1: 558. 1840.
Tillaea angustifolia Bolanderi S. Wats. Bot. Calif. 1: 209. 1876.
Tillaea Bolanderi Greene, Fl. Fran. 183. 1891.
Crassula aquatica Schoenl. in E. & P. Nat. Pfl. 3[2a]: 37. 1891.

Stems 1–8 cm. high. Leaves linear-oblong, entire, connate at the base, 4–6 mm. long: flowers solitary, axillary, sessile or short-peduncled, 1 mm. broad: calyx-lobes, petals, stamens and carpels 4, rarely 3; petals greenish, about twice the length of the calyx-segments; follicles ovoid, longer than the calyx-lobes, 8–10-seeded.

TYPE LOCALITY: Inundated places, Europe.
DISTRIBUTION: In mud, Nova Scotia to Maryland, Louisiana and Texas, Washington to Lower California and Colorado. Europe to northern Africa.
ILLUSTRATIONS: Fl. Deutsch. ed. 5, *pl. 2635;* Britt. & Brown, Ill. Fl. *f. 1809.*

2. **Tillaeastrum viride** (S. Wats.) Britton, Bull. N. Y. Bot. Gard. 3: 1. 1903.

Tillaea viridis S. Wats. Proc. Am. Acad. 23: 272. 1888.

Stems numerous, much branched, spreading, 7 cm. long or less. Leaves narrowly linear, 8–12 mm. long, about 1 mm. wide, acute; flowers very short-peduncled or sessile, minute; calyx-segments broadly ovate, obtuse, about 1 mm. long; petals longer than the calyx, obtuse, about as long as the carpels; follicles green, obtuse, 8-seeded, about 1 mm. long; seeds papillose.

TYPE LOCALITY: Wet places, base of Sierra Madre, Chihuahua.
DISTRIBUTION: Chihuahua. San Luis Potosi.

3. **Tillaeastrum Drummondii** (T. & G.) Britton, Bull. N. Y. Bot. Gard. 3: 1. 1903.

Tillaea Drummondii T. & G. Fl. N. Am. 1: 558. 1840.

Stems diffusely branched, decumbent, 2–10 cm. long. Leaves linear to linear-lanceolate, 2–4 mm. long, about 1 mm. wide, acute, subconnate; flowers peduncled, the peduncles at

first not longer than the calyx, at length several times longer and filiform; calyx-segments ovate, obtuse, shorter than the oblong petals and the obtuse 8–12-seeded carpels.

TYPE LOCALITY: Texas.
DISTRIBUTION: Muddy places, Louisiana to San Luis Potosi, California and Washington.

4. **Tillaeastrum Pringlei** Rose, Bull. N. Y. Bot. Gard. **3**: 2. 1903.

Delicate little plants growing in masses in damp mountain soil, 2–3 cm. high. Leaves linear, 3–4 mm. long, acute; flowers axillary, solitary on very short peduncles 1 mm. or less long, in fruit becoming 3 mm. long; carpels obtuse; seeds oblong, not papillose-roughened.

TYPE LOCALITY: Serrania de Ajusco, Federal District, Mexico.
DISTRIBUTION: Known only from the type locality.

5. **Tillaeastrum Vaillantii** (Willd.) Britton, Bull. N. Y. Bot. Gard. **3**: 2. 1903.

Tillaea Vaillantii Willd. Sp. Pl. 1: 720. 1798.
Bulliarda Vaillantii DC. Pl. Grasses *pl. 74*. 1801.
Crassula Vaillantii Schoenl. in E. & P. Nat. Pfl. 3^{2a}: 37. 1891.

Much branched, stems 10 cm. long or less. Flowers peduncled, the peduncles about as long as the leaves; leaves oblong.

TYPE LOCALITY: In wet places, France.
DISTRIBUTION: Prince Edward Island. Europe and northern Africa.
ILLUSTRATIONS: DC. Pl. Grasses *pl. 74*; Vaillant, Bot. Paris. *pl. 10, f. 2*; Lam. Tabl. Encycl. *pl. 90*.

4. **SEMPERVIVUM** (Dodoens) L. Sp. Pl. 464. 1753.

Perennial herbs, the succulent leaves imbricated on the short sterile shoots and scattered on the erect flowering stems, with compound cymes of showy flowers. Flowers 6–30-parted. Petals distinct, oblong or lanceolate, acute or acuminate. Stamens twice as many as the petals. Styles filiform; ovules numerous. Follicles many-seeded.

Type species, *Sempervivum tectorum* L.

1. **Sempervivum tectorum** L. Sp. Pl. 464. 1753.

Flowering stems about 3 dm. high, the barren shoots forming lateral nearly globular tufts. Leaves oval or ovate, the lower 2.5–4 cm. long, thick, short-pointed, bordered by a line of stiff short hairs; cyme large, dense, the flowers sometimes 2.5 cm. broad, pink, sessile along its branches; petals lanceolate, acute, 2 to 3 times as long as the obtuse ciliate sepals.

TYPE LOCALITY: Europe.
DISTRIBUTION: Massachusetts and New Jersey, escaped from cultivation. Native of continental Europe.
ILLUSTRATIONS: Engl. Bot. *pl. 1320*; Fl. Deutsch. ed. 5, *pl. 2653*; Britt. & Brown, Ill. Fl. *f. 1820*.

5. **SEDELLA** Britton & Rose, Bull. N. Y. Bot. Gard. **3**: 45. 1903.

Diminutive Californian annuals, with small ovate to ovate-oblong leaves and small yellow cymose flowers. Calyx with 5 very small, triangular acute teeth. Petals 5, linear to ovate-lanceolate, yellow, united at the base, spreading (?). Stamens 10. Carpels oblong, 1-seeded, the seed erect.

Type species, *Sedum pumilum* Benth.

Petals linear.	1. *S. pumila*.
Petals ovate-lanceolate.	2. *S. Congdoni*.

1. **Sedella pumila** (Benth.) Britton & Rose, Bull. N. Y. Bot. Gard. **3**: 45. 1903.

Sedum pumilum Benth. Pl. Hartw. 310. 1849.

Annual, usually branched, 3–8 cm. high, the branches erect or ascending, very slender. Leaves ovate-oblong, thick, 2–5 mm. long, broadest near the base, sessile, subcordate, acutish or obtuse at the apex, alternate, or the lower often opposite; cyme few-forked;

Ypa ἐξ ἰε ἐε ἐαν συνεπάγεται ἐε ἐεσσεν
(ἐαεε) ἐνεπάγεται, ἐαεἐ. ε ἐ' ἐεεε.
ἐεσσ. 3:12.1981.

2. Ἡ ἐαεἐ, ὁτ ἐνεπάγεται, ἐἐε ἐεἐε 13.
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flowers sessile or subsessile; petals yellow, linear, about 3 mm. long, longer than the stamens and smooth pistils; styles erect; scales none.

TYPE LOCALITY: Gravelly soil in the Sacramento Valley, California.
DISTRIBUTION: California.

2. **Sedella Congdoni** (Eastw.) Britton & Rose, Bull. N. Y. Bot. Gard. 3: 45. 1903.

Sedum Congdoni Eastw. Proc. Cal. Acad. III. 1: 135. 1898.

Annual, simple or branched from near the base, 1–6 cm. high, the branches tortuous, very slender, erect. Leaves alternate, very fleshy, ovate, obtuse, sessile, 2–4 mm. long, 1–2 mm. wide; cyme few-flowered, sparingly forked; flowers sessile; calyx-segments red-tipped; petals ovate-lanceolate, yellow, red-tipped, acute; carpels tuberculate near the apex; styles outwardly curved.

TYPE LOCALITY: Grant's Springs, Mariposa County, California.
DISTRIBUTION: California.
ILLUSTRATION: Eastwood, *loc. cit. pl. 11, f. 5.*

6. **PACHYPHYTUM** Link, Klotzsch & Otto, in Otto & Dietr. Allg. Gart. 9: 9. 1841.

Caulescent and more or less branched; leaves very thick, often terete. Flowers solitary, or in secund racemes. Calyx deeply lobed, the lobes appressed to the corolla, ovate to oblong, equal or unequal, shorter or longer than the corolla. Corolla deeply 5–7-parted, not at all 5-angled; petals erect below, spreading above. Stamens 10; the 5 alternating with the petals free from the corolla; the other 5 borne on the petals, each usually with a pair of appendages at the base; scales broad. Carpels 5, erect, free to the base. Styles short.

Type species, *Pachyphytum bracteosum* Klotzsch.

Stamens not appendaged at base. 1. *P. amethystinum.*
Stamens appendaged at base.
  Leaves decidedly flattened.
    Bracts small. 2. *P. sodale.*
    Bracts large.
      Leaves broad, obtuse. 3. *P. bracteosum.*
      Leaves very narrow. 4. *P. longifolium.*
  Leaves terete in section.
    Calyx-lobes obtuse. 5. *P. brevifolium.*
    Calyx-lobes acute.
      Leaves green, hardly glaucous. 6. *P. uniflorum.*
      Leaves bluish, very glaucous. 7. *P. aduncum.*

1. **Pachyphytum (?) amethystinum** Rose, sp. nov.

Shortly caulescent, perhaps 1 dm. high or more. Leaves scattered along the stem, very thick but flattened, oblanceolate, obtuse, about 4 cm. long, glaucous and with a beautiful amethyst tinge; peduncles weak; inflorescence somewhat compound, few-flowered; pedicels slender; calyx small, 5-lobed, the lobes ovate, almost acute; corolla bluish in herbarium specimens, small, about 8 mm. long, cleft to below the middle but with a tube longer than the calyx; stamens not appendaged.

Collected by J. N. Rose on the top of the high Sierra Madre west of Bolaños, Jalisco, September 15 to 17, 1897 (*no. 2993*).

Mr. Rose sent back a flowering branch and a living plant of this species which he has had under observation for seven years. It resembles *Pachyphytum bracteosum* in habit and foliage, but its flower-structure is so very different that it is referred to this genus with considerable hesitancy.

2. **Pachyphytum sodale** (Berger) Rose.

Echeveria sodalis Berger, Gartenflora 53: 206. 1904.

Caulescent, about 1 dm. high, leafy, glabrous throughout. Leaves about 9 cm. long, spatulate, 3 cm. broad just below the apex, narrowed at base into a short nearly terete petiole, green, not glaucous, obtuse; flowering stem rather weak, its leaves small; bracts small, acute; sepals ovate, acute; corolla-lobes oblong, acute, the 5 stamens attached to them bearing 2 acute appendages.

Only known from garden material distributed by Alwin Berger, La Martola, Italy. Mr. Berger has kindly sent a specimen of this species, which suggests a hybrid, between *P. bracteosum* and some other species, in which *P. bracteosum* is the dominant parent. It is, however, quite different from that species and we see no reason why it need not be distinct. Although Mr. Berger has published it as *Sedum-Cotyledon-Echeveria-Diotostemon sodalis*, it can not properly stand under any of these genera.

ILLUSTRATION: Gartenflora **53**: 202, *f. 29.*

3. **Pachyphytum bracteosum** Klotzsch in Otto & Dietr. Allg. Gart. **9**: 9. 1841.

Echeveria bracteosa Lindl. & Paxt. Flower Garden **3**: 60, *f. 261.* 1853.
Cotyledon Pachyphytum Baker, in Saund. Ref. Bot. **1**: sub *pl. 59*, no. 12. 1869.
Echeveria Pachyphytum Morren, Belg. Hortic. **24**: 157, as synonym. 1874.

Caulescent, 1–3 dm. high. Leaves oblanceolate to spatulate, thickish, 7–10 cm. long; flowering branches 3–6 dm. long, with a few small leaves; inflorescence a secund raceme, 12–18-flowered, at first curved, becoming erect; pedicels short, the lower ones spreading, 4–6 mm. long; bracts oblong to oval, obtuse, 1.5 cm. long or less; calyx deeply campanulate, 16–18 mm. long, its lobes oblong-spatulate, unequal; corolla bright-red, shorter than the calyx.

TYPE LOCALITY: Mexico.
DISTRIBUTION: Mexico, definite stations not known.
ILLUSTRATIONS: Link & Otto, Ic. Pl. Rar. *pl. 43*; Lindl. *loc. cit.*; Bot. Mag. *pl. 4951.*

4. **Pachyphytum longifolium** Rose, sp. nov.

Caulescent, about 10 cm. high, leafy to the base. Leaves thick but flattened, the lower ones spreading at right angles to the stem, the upper ones erect, 6 cm. long, oblanceolate, narrowed from below the apex to the base into a short terete petiole, acute, glaucous, tinged with purple; peduncle about 20 cm. long, erect, leafless except just below the inflorescence; bracts large, in two rows, cordate at base, at first imbricated; sepals glaucous, very large, unequal, the two outer and lateral ones nearly equal, broadly oblong, 15–18 mm. long, obtuse, very glaucous, the upper, inner one and the two lower smaller and narrower, nearly equal, 12–13 mm. long; corolla 8–9 mm. long, pale without, dark-red within, much shorter than the calyx, the lobes spreading above, broad and rounded at apex but with a small mucro, free nearly to the base.

Collected by C. A. Purpus in eastern Mexico in 1904 (Rose *no. 955*).
This species resembles somewhat in foliage the well known hybrid *E. clavifolia*, but has more pointed and longer leaves with a different apex and coloring. In inflorescence it suggests *P. bracteosum*, but the foliage is very different.

5. **Pachyphytum brevifolium** Rose, sp. nov.

Shortly caulescent, 4–5 cm. long in specimens seen. Leaves very short, 1–2 cm. long, doubtless terete in section, certainly very turgid, obtuse, whitish, perhaps glaucous; peduncle 1–2 cm. long; raceme few-flowered; pedicels 4–5 mm. long; calyx 6 mm. long, its lobes equal, broad and obtuse, nearly hiding the corolla, cleft nearly to the base; corolla-segments broad and thin, free nearly to the base, longer than the stamens; the 5 stamens alternate with petals free to the base, the other 5 borne on the petals and appendaged at base.

Collected by A. Dugès near Guanajuata, Mexico, January, 1898 (*no. 153*). Type in the Gray Herbarium; fragment in the U. S. National Herbarium.

6. **Pachyphytum uniflorum** Rose, Bull. N. Y. Bot. Gard. **3**: 11. 1903.

Perennial, caulescent, about 2 dm. high, either simple or branched at base, usually erect and stout, woody below. Leaves closely set on upper parts of branches, falling off below, very turgid, but slightly flattened, 3–5 cm. long, only slightly narrowed below, rounded at apex, not glaucous, but pale-green, except near the apex or even reddish throughout; flower-stems slender, erect or nearly so, appearing from the axils of the uppermost leaves of the rosette, pinkish, not glaucous, naked below, but with some 9 scattered leaves above, these about 1 cm. long, greenish or purplish, minutely auricled at base; calyx 5-lobed, 8 mm. long; lobes ovate, pinkish or greenish, acute; corolla 12 mm. long, 5 mm. broad, not at all or hardly angled in bud; lobes spreading, free nearly or

= N. Hoffmann (Oberlehr. Kgl. Realg.) Kurzer
Abriß der neuen Theorie d. Kräfte. Diss.
Leipzig. 1904.

quite to the base, acute; stamens 10, the five opposite the sepals free to the base; the other 5 borne on the petals, each with two broad truncate appendages at its base; scales broad; carpels 5, erect, free to the base.

TYPE LOCALITY: San Luis Potosi, Mexico.
DISTRIBUTION: Known only from the type locality.

7. **Pachyphytum aduncum** (Baker) Rose.

Cotyledon adunca Baker, in Saund. Ref. Bot. 1: *pl. 60.* 1869.
Pachyphytum roseum Baker, *loc. cit.* as syn. 1869.
Echeveria adunca Otto, Hamb. Gart. 29: 6. 1873.

Caulescent, 6–12 dm. high, glabrous throughout. Leaves oblong, very thick and turgid, 3–5 cm. long; flowering branches about 3 dm. long, nearly naked; inflorescence a secund raceme, 6–18-flowered, strongly curved; lower peduncles erect, much elongated; calyx-lobes equal, lanceolate, 9 mm. long; corolla scarcely 5-angled, 15 mm. long, yellowish, tinged with red.

TYPE LOCALITY: Mexico.
DISTRIBUTION: Mexico, definite stations not known.
ILLUSTRATION: Baker, *loc. cit.*

7. **ECHEVERIA** DC. Prodr. 3: 401. 1828.

Acaulescent or caulescent; leaves fleshy but usually broad and flat. Inflorescence usually a simple loose spike or raceme, or sometimes paniculate, never a flat cyme. Calyx deeply 5-parted, the sepals usually elongated and narrow, unequal, erect or spreading. Corolla 5-angled, usually strongly so, very broad at base, the lobes united below (sometimes appearing free?), very thick and nerveless, erect but often spreading at tip, broad and comparatively short; stamens 10, 5 attached near the middle of the petals, 5 either free or at least attached lower down on corolla; anthers oblong; scales large, thick, short and truncate or depressed in center; carpels free (sometimes described as united), oblong, erect, tapering into slender styles; ovules and seeds many.

Type species, *Cotyledon coccinea* Cav.

1. Sepals linear to ovate.
   a. Flowers axillary, arranged in loose spikes or equilateral racemes. (See no. 29.)
      * Flowers in spikes.
         Not caulescent; glabrous throughout.
            Leaves broad; flowers many. 1. *E. mucronata.*
            Leaves narrow, less than 1 cm. broad; flowers about 7. 2. *E. sessiliflora.*
         Caulescent; pubescent throughout.
            Leaves obovate-spatulate. 3. *E. pubescens.*
            Leaves oblanceolate-spatulate. 4. *E. coccinea.*
      ** Flowers in racemes.
         Caulescent.
            Inflorescence compound below; corolla pale. 5. *E. linguaefolia.*
            Inflorescence generally simple throughout; corolla bright colored.
               Pubescent throughout.
                  Leaves obtuse. 6. *E. pulvinata.*
                  Leaves acute. 7. *E. Pringlei.*
               Glabrous throughout.
                  Leaves scattered. 8. *E. nuda.*
                  Leaves densely rosulate.
                     Sepals ascending.
                        Stems roughened; stem and leaves not glaucous.
                           Flowering stems and sepals granulate. 9. *E. montana.*
                           Flowering stems and sepals not granulate.
                              Leaves broad, obovate or spatulate. 10. *E. multicaulis.*
                              Leaves narrow, linear-lanceolate. 11. *E. Goldmani.*
                        Stems not roughened; stem and leaves glaucous. 12. *E. australis.*
                     Sepals widely spreading.
                        Flowers few in a short raceme. 13. *E. nodulosa.*
                        Flowers many in a long lax raceme.
                           Leaves not narrowed at base. 14. *E. canaliculata.*
                           Leaves much narrowed at base. 15. *E. atropurpurea.*
   Not caulescent.
      Leaves colored.
         Sepals spreading at right angles to the corolla, or even reflexed; leaves narrow. 16. *E. lurida.*
         Sepals ascending, never reflexed; leaves broad.

Flowers many (more than 12). 17. *E. racemosa.*
Flowers 12 or fewer. 18. *E. carnicolor.*
Leaves green or spotted.
Leaves narrow, spotted. 19. *E. maculata.*
Leaves green.
Flowers lemon-yellow. 20. *E. paniculata.*
Flowers reddish. 21. *E. platyphylla.*

b. Flowers terminal, arranged in secund spikes or racemes, either simple or compound. (Except no. 29.)

* Inflorescence mostly a simple raceme.
Flowers sessile.
Bracts with a rounded spur. 22. *E. tenuis.*
Bracts with a retuse spur. 23. *E. Peacockii.*
Flowers pedicelled.
Lower pedicels short.
Basal leaves acuminate. 24. *E. strictiflora.*
Basal leaves not acuminate. 25. *E. subsessilis.*
Lower pedicels elongated.
Inflorescence two-branched. 26. *E. bifida.*
Inflorescence a simple raceme.
Leaves drying thick and leathery. 27. *E. humilis.*
Leaves drying thin.
Leaves not mucronate (may be looked for here). 50. *E. obtusifolia.*
Leaves mucronate.
Leaves bright green, not at all glaucous.
Leaves broadly ovate to oblanceolate, thin. 28. *E. Byrnesii.*
Leaves narrowly oblanceolate, thickish. 29. *E. pinetorum.*
Leaves grayish, glaucous.
Petals spreading in age. 30. *E. heterosepala.*
Petals connivent in age.
Leaves oblanceolate to spatulate.
Leaves thin; upper half of the corolla yellow. 31. *E. pumila.*
Leaves turgid; corolla rose-colored. 32. *E. turgida.*
Leaves ovate.
Leaves with a stout mucro. 33. *E. cuspidata.*
Leaves with a weak mucro.
Leaves not turgid.
Leaves glaucous green. 34. *E. glauca.*
Leaves with reddish margins.
Rosettes compact; top of leaf rounded. 35 *E. secunda.*
Rosettes more open; top of leaf ovate. 36. *E. tolucensis.*
Leaves very turgid.
Sepals spreading. 37. *E. elegans.*
Sepals appressed. 38. *E. simulans.*

** Inflorescence a compound raceme.
Flowers minute; inflorescence narrow, elongated. 39. *E. minutiflora.*
Flowers not minute; inflorescence broad.
Leaves terete, linear. 40. *E. teretifolia.*
Leaves flat and broad.
Acaulescent.
Sepals widely spreading almost at right angles to the corolla.
Basal leaves obovate, twice as long as wide.
Flowers deep-crimson; flowering stem 2–3 dm. long. 41. *E. retusa.*
Flowers pale-rose; flowering stem 4–10 dm. long. 42. *E. rubromarginata.*
Basal leaves oblong-oblanceolate, four times as long as wide. 43. *E. Lozani.*
Sepals erect and closely appressed to corolla.
Flowers small (corolla about 10 mm. long). 44. *E. Schaffneri.*
Flowers large (corolla 15 to 20 mm. long).
Branches many-flowered, sometimes 10-flowered. 45. *E. subrigida.*
Branches few-flowered, usually 3 or 4-flowered. 46. *E. Palmeri.*
Caulescent.
Leaves bright-green, not glaucous.
Leaves concave on the face.
Sepals ovate. 47. *E. Walpoleana.*
Sepals narrow. 48. *E. acutifolia.*
Leaves flat on the face.
Leaves acute, green on the margin. 49. *E. stolonifera.*
Leaves obtuse, reddish on the margin.
Sepals lanceolate. 50. *E. obtusifolia.*
Sepals ovate. 51. *E. scopulorum.*
Leaves bluish-green, more or less glaucous.
Leaves acute.
Leaves tapering into a long narrow stalk. 52. *E. Scheerii.*

Leaves somewhat narrowed downward but with a broad base. 53. *E. fulgens.*
Leaves obtuse.
Leaves rounded on the face. 54. *E. campanulata.*
Leaves concave or flat on the face. 55. *E. gibbiflora.*
2. Sepals orbicular to oblong, very small, obtuse.
Leaves green, not glaucous. 56. *E. pulchella.*
Leaves distinctly glaucous.
Sepals oblong. 57. *E. expatriata.*
Sepals orbicular.
Nearly acaulescent or short-caulescent; sepals appressed; corolla coral-red, twice as long as thick. 58. *E. amoena.*
Caulescent; sepals not appressed; corolla yellow-pink, little longer than thick. 59. *E. Purpusi.*

1. **Echeveria mucronata** Schlecht. Linnaea **13**: 411. 1839.

Cotyledon mucronata Baker, in Saund. Ref. Bot. 1: sub *pl. 55*, no. 4. 1869.

Acaulescent, glabrous throughout. Basal leaves in a dense rosette, obovate, spatulate, 7–10 cm. long, acute; flowering branches 3–4 dm. long, bracteate; flowers sessile, axillary, scattered; sepals ovate, acute, one-third the length of the corolla; corolla 15 mm. long, 5-angled, reddish, tinged with yellow.

TYPE LOCALITY: Mineral del Monte, Omitlan, Cuesta blanca, Mexico.
DISTRIBUTION: Central Mexico.
ILLUSTRATION: Schlecht. Hort. Hal. *pl. 10.*

2. **Echeveria sessiliflora** Rose, sp. nov.

Acaulescent. Leaves numerous in dense flat rosettes, 1 cm. broad, pale-blue, somewhat glaucous, lanceolate, acute; flowering stem 15–30 cm. high, with many ascending lanceolate leaves; inflorescence a very open spike with 12 flowers or more; sepals unequal, acute, much shorter than the corolla; corolla about 8 mm. long, 5-angled.

Collected by E. A. Goldman 20 miles southeast of Teopisca, Chiapas, Mexico, May 24, 1904 (*no. 978*).

3. **Echeveria pubescens** Schlecht. Linnaea **13**: 411. 1839.

Cotyledon pubescens Baker, in Saund. Ref. Bot. 1: sub *pl. 55*, no. 1. 1869.

Caulescent, 3–6 dm. high, velvety gray-pubescent throughout. Leaves obovate, spatulate, the largest 7 cm. long; inflorescence a spike of 15–25 flowers; bracts linear, the lower ones longer than the flowers; sepals linear, unequal, spreading, about as long as the corolla; corolla bright-red without, 15 mm. long. (Description drawn from Schlechtendal's illustration and Baker's description.)

TYPE LOCALITY: Mineral del Monte and Regla, Hidalgo.
DISTRIBUTION: Eastern Mexico.
ILLUSTRATIONS: Schlecht. Hort. Hal. *pl. 9;* Baker, in Saund. Ref. Bot. 3: *pl. 197.*

4. **Echeveria coccinea** (Cav.) DC. Prodr. **3**: 401. 1828.

Cotyledon coccinea Cav. Ic. **2**: 54. 1793.

Caulescent, 3–6 dm. high, finely gray-pubescent. Leaves oblanceolate, spatulate, the largest 10 cm. long; inflorescence a spike of 15–25 flowers similar to those of the last species.

TYPE LOCALITY: Cultivated in the royal garden, Madrid.
DISTRIBUTION; Mexico.
ILLUSTRATIONS: Cav. *loc. cit. pl. 170;* Bot. Mag. *pl. 2572;* Lodd. Bot. Cab. *pl. 832.*

5. **Echeveria linguaefolia** Lemaire, Ill. Hortic. **10**: Misc. 81. 1863.

Talinum linguaeforme Lemaire, *l. c.*, as syn. 1863.
Anacampseros linguaefolia Lemaire, *l. c.*, as syn. 1863.
Cotyledon linguaefolia Lemaire, *l. c.*, as syn. 1863.—Baker in Saund. Ref. Bot. 1: *pl. 58.* 1869.

Stems 3–4 dm. high. Leaves thick, fleshy, green, narrowed below and nearly terete at base; flowering branches long and drooping, each consisting of a simple raceme or somewhat branched at base; pedicels generally reflexed; sepals free nearly to the base, linear-lanceolate, fleshy, unequal, erect or appressed to corolla; buds pointed, somewhat 5-angled; corolla cream-colored, 8–10 mm. long, a little longer than the calyx, its lobes ovate-oblong,

erect, spreading at tips, united only at base; the stamens opposite the petals attached near the base, the alternate 5 free or nearly so; carpels 5, erect, distinct to the base or nearly so.

TYPE LOCALITY: Mexico.
DISTRIBUTION: Mexico.
ILLUSTRATION: Baker, *loc. cit.*

6. **Echeveria pulvinata** Rose, Bull. N. Y. Bot. Gard. **3**: 5. S 1903.

Cotyledon pulvinata Hook. f. Bot. Mag. *pl. 7918*. O 1903.

Caulescent, 12 cm. high, naked below, somewhat branching. Young branches, leaves and sepals covered with a dense white velvety pubescence; leaves clustered in a rosette at the top, obovate, tapering to a narrow base, 2.5–3 cm. long, 2 cm. broad, rounded at apex and apiculate, 5–6 mm. thick; flowers in a leafy raceme; pedicels 10–12 mm. long, bracteolate; sepals ovate, acute, unequal, the longest about half the length of the corolla; corolla scarlet, sharply 5-angled, 18–20 mm. long, pubescent without, the lobes apiculate.

TYPE LOCALITY: Tomellin Cañon, Oaxaca, Mexico.
DISTRIBUTION: Oaxaca.
ILLUSTRATION: Hook. f. *loc. cit.*

7. **Echeveria Pringlei** (S. Wats.) Rose, Bull. N. Y. Bot. Gard. **3**: 6. 1903.

Cotyledon Pringlei S. Wats. Proc. Am. Acad. **25**: 148. 1890.

Caulescent, decumbent, about 3 dm. long, pubescent throughout. Leaves oblanceolate, 5–10 cm. long, acute; inflorescence an equilateral raceme; pedicels 4–8 mm. long; sepals lanceolate, acuminate, 12–16 mm. long; petals about as long as sepals, free nearly to base, pubescent without; stamens a third shorter than petals.

TYPE LOCALITY: Dry shaded ledges of the barranca near Guadalajara, Mexico.
DISTRIBUTION: Only known from a resticted region about Guadalajara.

8. **Echeveria nuda** Lind. Gard. Chron. **1856**: 280. 1856.

Cotyledon nuda Baker in Saund. Ref. Bot. 1: *pl. 57*. 1869.

Stems about 1 dm. high. Leaves glabrous, slightly glaucous-green, obovate-spatulate, 4–6 cm. long, mucronate, scattered towards the apex of the stem; flowering branch 1–3 dm. long, leafy below; inflorescence an equilateral raceme, slightly compound below, 12–25-flowered; pedicels 1–3 mm. long; sepals very unequal, terete or nearly so, acute, widely spreading, very unequal, the longest about as long as the corolla; corolla 10–12 mm. long, decidedly 5-angled, pink below, yellowish above, the lobes acute and spreading.

The type was collected by Botteri, who sent specimens to the London Horticultural Society. It has recently been collected by Dr. Purpus and Frank N. Meyer. Dr. Purpus's plant has recently flowered and has been used in drawing up the description; Pringle's *no. 6779* from Tehuacan, Puebla, has also been referred here.

TYPE LOCALITY: Orizaba.
DISTRIBUTION: Central Mexico.
ILLUSTRATION: Baker, *loc. cit.*

9. **Echeveria montana** Rose, Bull. N. Y. Bot. Gard. **3**: 6. 1903.

Caulescent. Leaves in a dense rosette at the top of the stem, orbicular or obovate, somewhat narrowed below, glabrous, 5–6 cm. long; flowering stems somewhat granular-roughened above, rather densely leafy-bracted below, 2–3 dm. long, many-flowered; inflorescence an equilateral raceme; sepals ovate-lanceolate, 6–7 mm. long; corolla 1 cm. long.

TYPE LOCALITY: Sierra de San Felipe, Mexico.
DISTRIBUTION: Known only from the type locality.

10. **Echeveria multicaulis** Rose, Contr. U. S. Nat. Herb. **8**: 294. 1905.

Caulescent, the lower part of stem roughened, naked, crowned near the top by a rosette of obovate or spatulate leaves, the whole plant, including flowering branches, 2 dm. high in cultivation, but said to reach 9–12 dm. high in the wild state. Leaves 3–4 cm. long, 12–20 mm. broad at widest point, flattened, mucronate-tipped, glabrous, the margin and face more or less brightly colored; flowering branches rose-colored, bearing scattered

oblanceolate leaves; inflorescence a short compact equilateral raceme; flowers subtended by small rose-colored bracts; pedicels very short but distinct; calyx-lobes narrow, acute, ascending, about one half as long as the corolla; corolla-buds acute, angled; corolla reddish without, yellowish within.

Collected by E. W. Nelson and E. A. Goldman near Omiltema, State of Guerrero, Mexico, May, 1903 (Rose *no. 628*); flowered in Washington, December, 1903.

11. **Echeveria Goldmani** Rose, sp. nov.

Stems at first erect and bushy, often prostrate and rooting at the nodes, sometimes becoming 20 cm. high. Leaves glabrous, shining, linear-oblong, 2–3 cm. long, acute or obtusish, trough-shaped, pale-green with purple margins; inflorescence an equilateral (?) raceme, many-flowered; carpels erect.

Collected by E. A. Goldman at Comitan, Chiapas, Mexico, March 27, 1904, *no. 802*.

12. **Echeveria australis** Rose, Bull. N. Y. Bot. Gard. **3**: 6. 1903.

Caulescent, 2–3 dm. long, or 5–6 dm. including the inflorescence, glaucous. Leaves broadly spatulate, rounded at apex, 3–7 cm. long, sometimes 3 cm. broad and spoon-shaped, somewhat glaucous and often purplish, thickly set at apex of branches, early falling off below; flowering branches stout, bearing numerous large oblong bract-like leaves; inflorescence an elongated equilateral raceme or sometimes more compound forming a narrow panicle; pedicels 1 cm. long, or less, slender; sepals unequal, the longer ones 12 mm. long, ovate-oblong, purplish, glaucous, nearly or quite free to the base; petals bright-red, thickish, a little longer than the longest sepals, nearly distinct, cup-shaped at base; stamens 10, the 5 opposite the sepals borne on petals about one-fourth the distance above the base.

TYPE LOCALITY: San José, Costa Rica.
DISTRIBUTION: Costa Rica.

13. **Echeveria nodulosa** (Baker) Otto, Hamb. Gartenz. **29**: 8. 1873.

Cotyledon nodulosa Baker, in Saund. Ref. Bot. 1: *pl. 56*. 1869.

Caulescent, 1.5–2 dm. high, tumid, naked below, crowned by a dense rosette of leaves. Leaves obovate-spatulate, 5–7.5 cm. long, 18 mm. broad, dull apple-green, slightly glaucous, the margins reddish; inflorescence a lax equilateral raceme of 4–6 flowers; pedicels becoming erect, very short, the longest ones 4–5 mm. long; sepals spreading; corolla 12 mm. long, strongly 5-angled, straw-colored tinged with red.

TYPE LOCALITY: Mexico.
DISTRIBUTION: Central Mexico.
ILLUSTRATION: Baker, *loc. cit.*

14. **Echeveria canaliculata** Hook. Bot. Mag. *pl. 4986*. 1857.

Cotyledon canaliculata Baker, in Saund. Ref. Bot. 1: sub *pl. 58*, no. 9. 1869.

Stem very thick, 10–13 cm. long, glabrous throughout. Leaves in a dense rosette at the top of the stem, oblong or strap-shaped, 10–12 cm. long, thick, fleshy, tapering gradually to a slender tip; flowering branch, including the equilateral raceme, 3–5 dm. long; flowers 10–20; sepals somewhat unequal, linear, spreading at right angles to the corolla or even reflexed; corolla bright-red without, about 25 mm. long, strongly 5-angled.

As mentioned by Hooker this species is near *E. Scheerii* but, as he also states, the leaves are quite different. The inflorescence also seems more simple.

TYPE LOCALITY: Known only from garden specimens sent from the mountains of Real del Monte, Hidalgo, Mexico.
ILLUSTRATION: Bot. Mag. *loc. cit.*

15. **Echeveria atropurpurea** Baker, in Saund. Ref. Bot. **3**: *pl. 198*, as synonym. 1870. — Morren, Belg. Hortic. **24**: 156. 1874.

Cotyledon atropurpurea Baker, *loc. cit.*
Echeveria sanguinea Morren, Belg. Hortic. **24**: 156, as synonym. 1874.

Caulescent, 1–2 dm. high, glabrous throughout. Leaves aggregated at the top of the stem in a dense rosette, obovate to spatulate, 10–12 cm. long, dark-purple above, glaucous; flowering branch erect, 3 dm. long; inflorescence an equilateral raceme; pedicels 9 mm.

long, spreading, axillary; sepals somewhat unequal, spreading, 4 mm. long; corolla 12 mm. long, bright-red, strongly 5-angled.

TYPE LOCALITY: Mexico?
DISTRIBUTION: Known only in cultivation.
ILLUSTRATION: Baker, *loc. cit.*

16. **Echeveria lurida** Haw. in Tayl. Phil. Mag. **10**: 418. 1831.

Cotyledon lurida Baker in Saund. Ref. Bot. 1: *pl. 59.* 1869.

Acaulescent, glabrous. Leaves forming a flat, rather open rosette, narrowly oblong, 5–10 cm. long, 1.5–2.5 cm. broad, somewhat glaucous, acute, tinged with purple, especially when old; flowering branches 3–5 cm. long, 12–20-flowered; flowers axillary; bracts linear-lanceolate; pedicels 4–6 mm. long, spreading or the lowest recurved; sepals thick, spreading or even reflexed; corolla bright-red, 12–15 mm. long.

Only known from garden material, but undoubtedly from Mexico.

ILLUSTRATIONS: Lindl. Bot. Reg. **27**: *pl. 1*; Baker, *loc. cit.*; Bot. Mag. *pl. 3570* (?); Maund, Botanist *pl. 11* (*fide* Baker).

In Saunders' Refugium Mr. Baker combines *E. racemosa* and *E. lurida*, partly on account, doubtless, of the fact that *E. lurida* was known in cultivation under both names. In 1897 Mr. Rose visited Jalapa, Mexico, the type locality of *E. racemosa*, where he collected and sent home considerable living material. This has been under observation for a number of years and has been carefully compared with cultivated specimens of *E. lurida*. It has much broader leaves, longer and erect pedicels, ascending sepals and paler flowers.

17. **Echeveria racemosa** Schlecht. & Cham. Linnaea **5**: 554. 1830.

Stemless, glabrous and even glaucous. Basal leaves numerous, forming a dense rosette, deep-purple, concave, broad and rather thin or somewhat fleshy, 5 cm. long or less; flowering branches 1 to several, from the axils of the lower leaves, 2–3 dm. high, ascending, leafy-bracted (the leaves falling off at the merest touch even in growing plants); inflorescence a single equilateral raceme, 20–40-flowered; flowers strictly axillary; pedicels 2–4 mm. long; sepals somewhat unequal, acute, ascending; corolla yellowish, strongly 5-angled, 11–12 mm. long, the lobes erect.

TYPE LOCALITY: Jalapa, Mexico.
DISTRIBUTION: Jalapa.

18. **Echeveria carnicolor** (Baker) Morren, Belg. Hortic. **24**: 158. 1874.

Cotyledon carnicolor Baker, in Saund. Ref. Bot. 3: *pl. 199.* 1870.

Acaulescent, glabrous. Leaves about 20, forming a dense rosette, flat but thickish, oblanceolate-spatulate, 5 cm. long, pale glaucous-green tinged with red; flowering branches 1.5 dm. long, 6–12-flowered; sepals subequal; corolla bright-red, 5-angled, 12 mm. long.

TYPE LOCALITY: Mexico.
DISTRIBUTION: Known only from garden specimens.
ILLUSTRATION: Baker, *loc. cit.*

19. **Echeveria maculata** Rose, Bull. N. Y. Bot. Gard. **3**: 7. 1903.

Acaulescent, glabrous throughout. Basal leaves in a dense rosette, elongated-lanceolate, thickish, about 1 dm. long, 1.5–2 cm. broad, acute, dark-green and somewhat mottled; flowering branches stout, 6–8 dm. long, their lower leaves 8–10 cm. long; inflorescence paniculate, the lower branches bearing 3 or 4 sessile flowers arranged along one side of the branch, the upper flowers in the panicle axillary and sessile; sepals very unequal, somewhat spreading, fleshy, acute; corolla pale lemon-yellow, 10 mm. long; lobes free nearly to the base, acute at tip and slightly spreading.

TYPE LOCALITY: Dublan, Hidalgo, Mexico.
DISTRIBUTION: Known only from central Mexico.

20. **Echeveria paniculata** A. Gray, Pl. Wright. **1**: 76. 1852.

Cotyledon Grayi Baker, in Saund. Ref. Bot. 1: sub *pl. 71*, no. 33. 1869.
Echeveria Grayi Baker; Morren, Belg. Hortic. **24**: 161, as synonym. 1874.

Acaulescent, glabrous throughout. Basal leaves 15 or more, forming a dense rosette, at first erect, afterward spreading, 6–7 cm. long, 15–20 mm. broad, pale glaucous-green, acute;

Also Kidderpore (Principle 8778)

flowering branch slender, about 45 cm. high, leafy, the leaves 3 cm. long, thickish, rounded below, flattish above, scattered, acute; inflorescence either a simple equilateral raceme 18 cm. long or a panicle of erect racemes; flowers 12–15, scattered, axillary; pedicles short, 2–4 mm. long; bractlets similar to sepals but smaller; sepals thick, linear, spreading, somewhat unequal, 5–8 mm. long; corolla pale reddish-yellow, 5-angled, 10 mm. long.

TYPE LOCALITY: Cosiquiriachi, Chihuahua, Mexico.
DISTRIBUTION: Chihuahua and Durango.

21. **Echeveria platyphylla** Rose, Bull. N. Y. Bot. Gard. **3**: 7. 1903.

Acaulescent, glabrous throughout. Basal leaves in a dense rosette, somewhat rhomboid in outline, thinnish, pale-green, acuminate, tipped with a slender cusp, 4–5 cm. long, about 2 cm. broad; flowering branch 2–3 dm. long, bearing small scattered leaves below; flowers 15–20, arranged in an equilateral raceme; pedicels 3 mm. long or less; sepals green, thickish, linear, erect, subequal; corolla reddish-yellow, lobes 9 mm. long, tips spreading even in age, tube very short, 1–2 mm. long.

TYPE LOCALITY: Valley of Mexico, Mexico.
DISTRIBUTION: Known only from the type locality.

22. **Echeveria tenuis** Rose, Bull. N. Y. Bot. Gard. **3**: 7. 1903.

Acaulescent, glabrous throughout. Leaves fleshy, numerous, forming a flattened rosette, oblong, 4–5 cm. long, much narrowed at base, acute; flowering branches slender, at first nodding or scorpioid, their leaves linear or at least narrow, with a small rounded spur at base; flowers sessile or nearly so; sepals very unequal, broadly ovate to linear; corolla 9 mm. long, the segments in dry specimens keeled on the back, with scarious margins, not connivent in age, united for about one-fourth their length.

TYPE LOCALITY: Near Monte Escobedo, Zacatecas, Mexico.
DISTRIBUTION: Known only from the type locality.

23. **Echeveria Peacockii** Croucher, Gard. Chron. II. **1**: 674. 1874.

Cotyledon Peacockii Baker, Gard. Chron. II. **2**: 258. 1874.
Echeveria Desmetiana L. de Smet; Morren, Belg. Hortic. **24**: 159. 1874.
Cotyledon Desmetiana Hemsl. Biol. Centr. Am. Bot. **1**: 389. 1880.

Acaulescent. Basal leaves about 50 in a close rosette, obovate-spatulate, 5–7 cm. long, 3–4 cm. broad, white-glaucous, slightly red towards the top, faintly keeled on the back; flowering branch about 3 dm. long; inflorescence a scorpioid spike, the lower flowers somewhat distant; bracts two-spurred at base; sepals linear, very unequal, thick; corolla bright-red, 12 mm. long; stamens and styles one-fourth shorter than the corolla.

TYPE LOCALITY: Said to have been collected in "New Mexico," also said to be "Californian," but doubtless sent from central Mexico.
DISTRIBUTION: Mexico.

24. **Echeveria strictiflora** A. Gray, Pl. Wright. **1**: 76. 1852.

Cotyledon strictiflora Baker, in Saund. Ref. Bot. **1**: sub *pl. 62*, no. 17. 1869.

Acaulescent. Basal leaves spatulate-lanceolate, 6–10 cm. long, acuminate, glabrous, pale-green and slightly glaucous, the upper part with bright-red margins; flowering branches 2–4 dm. long, either simple or two-forked; branches of inflorescence each forming a secund raceme 1–1.5 dm. long; pedicels very short; sepals unequal, oblong; corolla twice as long, "scarlet."

TYPE LOCALITY: Mountains west of the pass of Limpia.
DISTRIBUTION: Northern Mexico and western Texas.

25. **Echeveria subsessilis** Rose, sp. nov.

Acaulescent or nearly so. Leaves forming a very dense rosette, much thicker than in *E. glauca*, ovate or obovate, 3–4 cm. long, 2–3.5 cm. broad, only slightly narrower at base, often obtuse, keeled above, obtuse to truncate, strongly mucronately tipped somewhat back of the margin, very glaucous, rosy-margined; flowering stem slender, 15 cm. tall, leafy-bracted above; raceme secund, at first hooked; bracts broadly ovate, 2–3-spurred at base;

flowers about 20, subsessile, the lower pedicels not elongating; sepals very unequal, the lower ones about half the length of the corolla; flower-buds fluted; corolla 10 mm. long, salmon-red, the lobes erect, acute, connivent in age; stamens and erect style about two-thirds the length of the corolla; stigmas green.

Collected by Dr. Wm. Trelease near Tehuacan, Puebla, Mexico; flowered in June, 1904 (Mo. Bot. Gard. accession no. 130/04/30).

This species seems to be nearest *E. Peacockii*, having glaucous leaves, a very similar inflorescence and flowers. It differs chiefly in that the leaves are shorter and somewhat different in shape, the flowers not strictly sessile and the floral bracts are broader. The rosettes of leaves suggest *E. cuspidata* but the inflorescence is quite different. *E. glauca* and *E. secunda* have very different leaves and pedicels.

26. **Echeveria bifida** Schlecht. Linnaea **13**: 411. 1839.

Cotyledon bifida Hemsl. Biol. Centr. Am. Bot. **1**: 388. 1880.

Leaves in rosettes, rhomboid to lanceolate; inflorescence two-branched, each branch a secund raceme; pedicels 8 mm. long; corolla 12 mm. long. Said to resemble *E. secunda*.

TYPE LOCALITY: "In Barranca post Regla versus San Bartolo."
DISTRIBUTION: Known only from the type locality.

27. **Echeveria humilis** Rose, Bull. N. Y. Bot. Gard. **3**: 8. 1903.

Acaulescent, or with a short woody caudex, glabrous throughout. Basal leaves in a dense rosette, thickish, lanceolate, acute, 5–6 cm. long; flowering stems about 1 dm. long, rather weak, leafy below; inflorescence a few-flowered secund raceme, sometimes paniculately branched; pedicels 2–3 mm. long, bractless; sepals lanceolate, very unequal, the longer 4–5 mm. long, acute; corolla 8–9 mm. long, its segments united for about one-fourth their length.

TYPE LOCALITY: San Luis Potosi, Mexico.
DISTRIBUTION: San Luis Potosi.

28. **Echeveria Byrnesi** Rose, sp. nov.

Acaulescent, forming dense rosettes of leaves. Leaves bright-green or tinged with red, not at all glaucous, obovate to oblanceolate, 4–5 cm. long, about 2 cm. broad at widest part, mucronate; inflorescence a secund raceme; leaves of flowering stem narrow; sepals narrowly ovate, acute; corolla about 1 cm. long, the lobes acute, winged on the back (at least in herbarium specimens).

Collected by J. N. Rose and Jos. H. Painter on the Volcano of Toluca, Mexico, October 15, 1903 (*no. 7991*). Living specimens (*no. 918*) were also sent home which show clearly that the species, while of the *E. secunda* and *E. glauca* type, is very distinct from them. This species, on account of its dense rosettes of green leaves, ought to become a useful bedding plant: it is named for Mr. E. M. Byrnes, for many years an expert grower of Echeverias, now Superintendent of Gardens and Grounds in the U. S. Department of Agriculture.

29. **Echeveria pinetorum** Rose, sp. nov.

Acaulescent, forming very dense rosettes of leaves. Leaves bright-green, the margins tinged with red, narrowly oblanceolate, 2–4 cm. long, 1–1.5 cm. broad, rounded beneath, acute and mucronate-tipped; flowering stem, including the inflorescence, 1–2.5 dm. long, bearing closely set leaves 2–3 cm. long, below, and small ovate ones above; inflorescence an open-flowered equilateral raceme or spike; flowers subsessile; sepals ovate, acute, somewhat unequal; corolla 8–10 mm. long, its lobes acute.

Collected by E. A. Goldman in pine woods 20 miles southeast of Teopisca, Chiapas, Mexico, May 8, 1904 (*no. 1013*); flowered in Washington, March, 1905.

The imperfection of the original material of this species led to its association with *E. Byrnesii*. The recent flowering of some of the plants, which has shown that its true relationship is rather with *E. sessiliflora*, occurred in time to correct the description, but too late to alter the arrangement of the species.

30. **Echeveria heterosepala** Rose, Bull. N. Y. Bot. Gard. **3**: 8. 1903.

Acaulescent. Basal leaves forming a dense rosette, obovate, somewhat acuminate, tipped with a long mucro, glabrous, perhaps also glaucous, 3 cm. long (in specimens seen); leaves of lower part of flowering branches large, above somewhat reduced; inflorescence a secund raceme, 12–15-flowered, at first nodding; lower pedicels longer, 6–7 mm. long;

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bractlets ascending; sepals ovate, more or less united at base, very unequal, the longer ones 6–7 mm. long; corolla reddish, short and broad, 8–9 mm. long.

Very similar to *E. glauca* in habit, but with different flowers.
TYPE LOCALITY: Near Tehuacan, Puebla, Mexico.
DISTRIBUTION: Puebla.

31. **Echeveria pumila** Van Houtte, Cat. 1846; Schlecht. Hort. Hal. 20. 1853.

Cotyledon pumila Baker, in Saund. Ref. Bot. 1: *pl. 62.* 1869.
Echeveria secunda pumila Otto, Hamb. Gartenz. 29: 9. 1873.

Not at all caulescent, glabrous, copiously stoloniferous from the crown of the root. Leaves 50 or 60 in a very dense rosette, the outer ones spreading, 25–40 mm. long, 12–15 mm. broad at widest point, pale glaucous-green, becoming tinged with red upwards; inflorescence like that of *E. secunda*, from which it differs chiefly in its narrower leaves.

TYPE LOCALITY: Mexico.
DISTRIBUTION: Mexico.

32. **Echeveria turgida** Rose, sp. nov.

Acaulescent. Leaves very numerous, forming very compact rosettes, very turgid, spatulate-oblong. mucronate-tipped, grayish-green, somewhat glaucous, the tips and margin more or less tinged with red; flowering stems about 10 cm. long, red above, paler below; leaves 6–8 cm. long, acute, narrow, semiterete; flowers 4–6, in a secund raceme; lower pedicels 6–8 mm. long, the upper ones gradually shorter; sepals spreading at right angles to the corolla-tube, the larger ones 6 mm. long, the two smaller minute; corolla rose-colored, 5-angled, 10 mm. long, its lobes pointed.

Collected by C. A. Purpus on limestone rock near Viesca, Coahuila, Mexico, February 20, 1904; flowered in Washington, January, 1905 (Rose *no. 962*).

33. **Echeveria cuspidata** Rose, Bull. N. Y. Bot. Gard. **3**: 9. 1903.

Acaulescent. Leaves in a dense rosette, sometimes a hundred or more, very glaucous on both sides, somewhat tinged with red, obovate in outline, about 6 cm. long, often 3.5 cm. broad at widest point, cuspidate; flowering stalk 2–4 dm. long, glabrous and pale, sometimes rose-colored, bearing throughout its length scattered small ovate leaves free at base and acute at each end; inflorescence a simple secund raceme, at first strongly nodding, about 15-flowered; buds arranged in two rows, obtusish; lower pedicels elongated, 10 mm. long or less; sepals unequal, all much shorter than the corolla, ovate, acute; corolla 1 cm. long, purplish with yellowish slightly spreading acute tips, the lobes united for about one-fourth their length; stamens 10, all inserted on the corolla-tube, the 5 opposite the sepals inserted at the top of the tube, the other 5 inserted a little lower down on the tube; carpels erect, free to the base.

TYPE LOCALITY: Saltillo, Mexico.
DISTRIBUTION: Known only from the type locality.

34. **Echeveria glauca** Baker, in Saund. Ref. Bot. **1**: *pl. 61*, as synomym. 1869.—Morren, Belg. Hortic. **24**: 161. 1874.

Cotyledon glauca Baker, *loc. cit.*
Echeveria secunda glauca Otto, Hamb. Gartenz. 29: 9. 1873.

Leaves in small but dense rosettes, nearly orbicular, about 2 cm. in diameter, broadened just above the apex, almost truncate, but with a decided purple mucro, very pale and slightly glaucous; flowering stalk 1–1.5 cm. long, quite reddish above, few-leaved, the leaves small, ovate to orbicular, greenish or pinkish, slightly produced backward at base; inflorescence a simple secund raceme, at first strongly nodding, 15–20-flowered; lower pedicels longer, 3–4 mm. long; sepals greenish, somewhat unequal, one-third to one-fourth the length of the corolla; buds shortly oblong, acute; corolla 1 cm. long, pinkish without except the spreading tips, and these as well as inside of corolla yellow; old flowers triangular, acute at tip.

TYPE LOCALITY: Mexico.
DISTRIBUTION: State of Mexico.

35. **Echeveria secunda** Booth, in Lindl. Bot. Reg. **24**: Suppl. 59. 1838.

Echeveria spilota Kunze, in Schlecht. Hort. Hal. 20, as synonym. 1853.
Cotyledon secunda Baker, in Saund. Ref. Bot. 1: sub *pl. 60.* no. 14. 1869.

Acaulescent, glabrous, freely sending out lateral stolons. Leaves numerous, inclined to be erect, forming a rather dense rosette, bluish-green, glaucous, ovate-cuneate, broad at apex but tipped by a strong mucro (rarely? with one or two lateral teeth), the mucro and margin more or less reddish. "Flowering branches a foot high, slender, terete, pinkish-glaucous with a few distinct small bract-like leaves; flowers twelve to fifteen in a secund raceme, which is finally 4–6 inches long."

TYPE LOCALITY: Mountains east of the City of Pachuca, State of Hidalgo, Mexico.
DISTRIBUTION: Hidalgo.

36. **Echeveria tolucensis** Rose, sp. nov.

Acaulescent or in age shortly caulescent. Leaves forming rather open rosettes, usually ascending, pale, glaucous, oblanceolate, 4–6 cm. long, 15–22 mm. broad at widest point, strongly mucronate; inflorescence a secund raceme; flowers 7–12; sepals broadly ovate, obtuse; corolla about 12 mm. long.

Collected by J. N. Rose and Jos. H. Painter near Toluca, Mexico, September 4, 1903 (*no. 6818*).

37. **Echeveria elegans** Rose, sp. nov.

Leaves numerous, in cultivated specimens 80–100, in wild specimens fewer and smaller, in both forming a very compact rosette, very glaucous, of a pale bluish-green color, very turgid, the margins translucent or in wild specimens reddish, 3 cm. long in wild specimens to 5–6 cm. in cultivated specimens, 2.5 cm. broad near the apex, rounded at apex, except the central ones, and these mucronate-tipped. Flowering branches 10–20 cm. long, pinkish, with 8–12 pinkish leaves; flowers 5–7 in a secund raceme; sepals bright-colored, very unequal, often toothed near the base, ascending, not appressed to the corolla; buds broadly oblong in outline, acutish; corolla 10 mm. long, its segments distinct nearly to the base, pinkish with yellow spreading tips, but connivent in age; stamens all borne on the corolla, attached just above its base, ⅔ its length; scales broad; carpels distinct, tapering into slender styles.

Collected by J. N. Rose in the mountains above Pachuca in 1901 and flowered in Washington, February, 1904 (*no. 960*, type); collected again in 1903 at the same locality (*no. 737*).

38. **Echeveria simulans** Rose, sp. nov.

Very similar to *E. elegans*, but rosettes flatter, the leaves at most spreading, never reflexed, thinner especially in the upper half; numerous, somewhat mucronate. Flowering branches at first nodding, becoming erect, pale below, pinkish above; stem-leaves linear, small and bract-like; sepals pinkish, unequal, narrow, acute, appressed to the corolla; corolla narrow, the base rose-colored, the tips of the lobes and inner surface yellow; carpels more or less spreading when mature.

Collected by C. G. Pringle in a cañon near Monterey, Mexico, in 1903; flowered in Washington in 1904 and 1905 (Rose *no. 768*).

It differs from *E. elegans* in habit and leaves, as mentioned above, has a narrower corolla, and narrower and more appressed sepals.

39. **Echeveria minutiflora** Rose, Bull. N. Y. Bot. Gard. **3**: 9. 1903.

Flowering stems glaucous, clothed with thick leaves. Basal leaves forming a rosette, 7–10 cm. long, oblong, obtuse, light-green, glabrous, tapering at base into a short petiole; inflorescence composed of small cymes, single flowers and twinned flowers arranged in a thick leafy spike; sepals longer than the corolla, somewhat unequal; corolla-segments spreading, ovate, acute, separated nearly to the base, greenish-yellow spotted with red.

TYPE LOCALITY: Near Tehuacan, Puebla.
DISTRIBUTION: Puebla and Oaxaca.

: Nunc hunc et illa mi mei Lesbia
sed N. 540

40. **Echeveria teretifolia** DC. Prodr. 3: 401. 1828.

Cotyledon subulifolia Baker, in Saund. Ref. Bot. 1: sub *pl. 71*, no. 32. 1869.
Echeveria subulifolia Morren, Belg. Hortic. 24: 168. 1874.

Leaves of flowering branches terete, 2.5 cm. long, numerous; flowers sessile in secund spikes; sepals linear, unequal; corolla 5-angled, reddish-yellow. Only known from De Candolle's illustration of a flowering branch, and perhaps not an *Echeveria*.

TYPE LOCALITY: Mexico.
DISTRIBUTION: Known only from the type locality.
ILLUSTRATION: DC. Mem. Crass. *pl. 6, f. A*.

41. **Echeveria retusa** Lindl. Jour. Hort. Soc. London 2: 306. 1847.

Cotyledon retusa Baker, in Saund. Ref. Bot. 1: sub *pl. 64*, no. 22. 1869.

Acaulescent or nearly so, glabrous throughout. Leaves in a dense rosette, obovate to spatulate, 7.5 cm. long; flowering stem 2 dm. long, leafy below; inflorescence a very compact panicle; sepals narrow, very unequal, shorter than the corolla; corolla strongly 5-angled, bright-red, 15 mm. long.

TYPE LOCALITY: Anganguco, Michoacan, Mexico.
DISTRIBUTION: Mexico.
ILLUSTRATION: Bot. Reg. 33: *pl. 57*.

42. **Echeveria rubromarginata** Rose, sp. nov.

Acaulescent or short-caulescent. Leaves few, about 12, stiff, ascending, oblanceolate, 6–12 cm. long, narrowed to a short thick petiole, obtuse, mucronate, glabrous, glaucous, with somewhat crenulate margins; flowering stems 5–12 dm. high, the lower leaves spatulate and obtuse, the upper ones ovate and acute; inflorescence paniculate, 1–2 dm. long; pedicels very short; sepals very unequal, the longer ones 8–9 mm. long, spreading, glaucous; corolla pale rose-colored, 12 mm. long, a little paler within, the lobes acute, thick.

Collected by C. A. Purpus on rock near Orizaba, Mexico, December, 1903 (Rose *no. 930*, type) and also near Orizaba by Frank M. Meyer, June, 1904 (Rose *no. 1015*). This species seems nearest *E. retusa* but it has different leaves, sepals, and corolla.

43. **Echeveria Lozani** Rose, sp. nov.

Acaulescent. Leaves forming a dense rosette, lying flat upon the ground, lanceolate or strap-shaped, 10 cm. long or more, 2–4 cm. broad at widest point, flattened and rather thickish except at the base, but here very thick and somewhat channeled, acute, glabrous, the central ones copper-colored; flowering stems 3–4 dm. long; inflorescence a short panicle; sepals unequal, ovate, acute; corolla light copper-colored, the lobes acute.

Collected by C. G. Pringle and his assistant Filamon L. Lozano in mountains near Etzatlan, Jalisco, Mexico, October 27, 1903 (*no. 11890*).

44. **Echeveria Schaffneri** (S. Wats.) Rose, Bull. N. Y. Bot. Gard. 3: 9. 1903.

Cotyledon Schaffneri S. Wats. Proc. Am. Acad. 17: 354. 1882.

Acaulescent, more or less purplish throughout, somewhat glaucous. Basal leaves in a rather dense rosette, broadly lanceolate, acuminate, 5–6 cm. long; flowering branches 3–4 dm. high, strict, leafy below; inflorescence at first very compact, more open in age, paniculate, many-branched, its branches forming few-flowered secund racemes; flowers very short-pedicelled, the pedicels 1–2 mm. long; sepals lanceolate, unequal, the longer ones 5–6 mm. long, acute; corolla red, 1 cm. long; corolla-segments united for one-fourth their length, acute.

TYPE LOCALITY: Sandy slopes of mountains around San Luis Potosi.
DISTRIBUTION: San Luis Potosi.

45. **Echeveria subrigida** (Rob. & Seaton) Rose, Bull. N. Y. Bot. Gard. 3: 10. 1903.

Cotyledon subrigida Rob. & Seaton, Proc. Am. Acad. 28: 105. 1893.

Acaulescent, glabrous throughout. Leaves in a dense rosette, flat, ovate, acute, very glaucous, bluish-green, tinged with purple, the margins of young ones bright-scarlet;

inflorescence an elongated panicle, 4–6 dm. long, its branches composed of one-sided racemes; sepals lanceolate, acuminate, half as long as the corolla; corolla 15–18 mm. long, red.

TYPE LOCALITY: Tultenango Cañon, Mexico.
DISTRIBUTION: Known only from the type locality.

46. **Echeveria Palmeri** Rose, Bull. N. Y. Bot. Gard. 3 : 10. 1903.

Acaulescent. Leaves numerous, erect or slightly spreading, pale-green, at first somewhat glaucous, with reddish margins, rhomboid or oblanceolate, the largest ones 2 dm. long, 1 dm. broad at widest part, narrowed at base and there 2–4 cm. broad, flat and fleshy but not very thick except at base, acute; flowering branches thick and stout, 6–8 dm. high, green and slightly glaucous below, reddish or rose-colored above, bearing a few scattered oblong leaves 4–5 cm. long; inflorescence a rather compact panicle, 1–2 dm. long, its branches somewhat glaucous, short, 3–4-flowered; pedicels stout, 3–6 mm. long; calyx deeply 5-parted; lobes very unequal, linear to narrowly ovate, acute, the longer ones 10 mm. long; corolla-buds sharply 5-angled, acute, broadly ovate in outline, somewhat glaucous; corolla 2 cm. long, 12 mm. broad at base, reddish-yellow, deeply parted into 5 lobes, the tube proper only 3 mm. long; lobes oblong, thickish, somewhat spreading at tip but connivent in age, gibbous at base; stamens 10, all inserted at top of corolla-tube, those opposite the petals broad at base; appendages lunate, deep-purple, depressed in the center; carpels erect, distinct or nearly so, tapering into the slender purple styles; ovules many.

TYPE LOCALITY: High mountains about Alvarez near the city of San Luis Potosi, Mexico.
DISTRIBUTION: Known only from the type locality.

47. **Echeveria Walpoleana** Rose, Contr. U. S. Nat. Herb. 8 : 295. 1905.

Acaulescent or becoming shortly caulescent in age. Leaves forming a dense rosette, at first pale-green with reddish margins but becoming deeply tinged with red throughout, thickish, rounded on the back, boat-shaped above, sharply acute, 6–8 cm. long, 2–2.5 cm. broad, glabrous; flowering stem 30–40 cm. long, its leaves thickish, acute; inflorescence two-branched, each branch a secund raceme of 8–10 flowers; pedicels very short; sepals spreading, ovate, acute, green; corolla about 14 mm. long, deeply orange-colored, the lobes erect, very thick, triangular in cross-section, acute; stamens about half the length of the corolla-lobes and attached near the top of the corolla-tube; carpels erect.

Collected by Dr. E. Palmer near Las Canoas, San Luis Potosi, Mexico, November, 1902, and flowered in Washington, in August, 1903.

48. **Echeveria acutifolia** Lindl. Bot. Reg. 28 : *pl. 29*. 1842.

Cotyledon acutifolia Baker, in Saund. Ref. Bot. 1 : sub *pl. 71*, no. 34. 1869.

Caulescent, glabrous throughout. Leaves rhomboid, concave, strongly narrowed at base; inflorescence a narrow erect panicle; sepals narrow, very unequal; corolla red, more or less tinged with yellow in age, 5-angled.

TYPE LOCALITY: Oaxaca.
DISTRIBUTION: Known only from the type locality.
ILLUSTRATION: Lindley, *loc. cit.*

49. **Echeveria stolonifera** (Baker) Otto, Hamb. Gartenz. 29 : 9. 1873.

Cotyledon stolonifera Baker, in Saund. Ref. Bot. 1 : *pl. 63*. 1869.

Short-caulescent; stoloniferous. Leaves 30–40, in a dense rosette, obovate to spatulate, 5–6 cm. long, bright-green, slightly glaucous; flowers 4–6 "in a close cyme"; sepals very unequal, linear; corolla yellowish, decidedly 5-angled.

TYPE LOCALITY: Mexico.
DISTRIBUTION: Known only from the type locality.
ILLUSTRATION: Baker, *loc. cit.*

50. **Echeveria obtusifolia** Rose, Bull. N. Y. Bot. Gard. 3 : 8. 1903.

Acaulescent, perhaps sometimes short-caulescent, glabrous throughout. Leaves spreading, forming a rosette 2 dm. broad or more, oblanceolate, rounded at apex, 3.5 cm. broad at widest point, narrowed to 5 mm. at base, thinnish; flowering branches 2–3 dm. long,

bearing leaves 5–6 cm. long, ascending; inflorescence of 2 or 3 one-sided racemes, 12–20-flowered; lower pedicels 10 mm. long, ascending; sepals acute, very unequal, lanceolate; corolla red, 8–12 mm. long, rather narrow.

TYPE LOCALITY: Near Cuernavaca, Morelos, Mexico.
DISTRIBUTION: Mountains of Morelos.

51. **Echeveria scopulorum** Rose, sp. nov.

Short-caulescent, glabrous throughout. Stems crowned by rosettes of obovate leaves; leaves 5–8 cm. long, somewhat concave, rounded at apex; flowering stem about 20 cm. long, red, not glaucous, few-flowered; stem-leaves 2 or 3, thickish, short, rather stiff, hardly if at all glaucous; pedicels short and stout; sepals ovate, spreading, extending only a short distance beyond the base of the corolla; corolla short (10 mm. long) and broad, when in bud obtuse, dark-red.

Collected by E. A. Goldman near Tres Marias, Morelos, Mexico, altitude about 2,700 meters; flowered in Washington in 1903 and 1904 (Rose *no. 653*).

Somewhat resembling *E. obtusifolia*, but stems less glaucous, sepals much shorter and corolla much broader; it occurs at much higher elevations.

52. **Echeveria Scheerii** Lindl. Bot. Reg. **31**: *pl. 27.* 1845.

Cotyledon Scheerii Baker, in Saund. Ref. Bot. 1: sub *pl. 62*, no. 19. 1869.

Caulescent, sometimes 6 dm. tall or more, often branching, glabrous and somewhat glaucous. Leaves rosulate, oblong-spatulate, often 2 dm. long, narrowed into distinct petioles; inflorescence a few-branched panicle; flowers terminal; sepals distinct or nearly so, spreading almost at right angles to the corolla, linear, acute, very unequal; buds acute and strongly 5-angled; petals red or tinged with yellow, thick, erect but spreading at tip, free nearly to base, 15 mm. long; the stamens opposite the petals attached near the base, the 5 alternating ones free; carpels erect, free, or nearly so, to the base.

TYPE LOCALITY: Mexico.
DISTRIBUTION: Known only in cultivation.
ILLUSTRATION: Lindley, *loc. cit.*

53. **Echeveria fulgens** Lemaire in Hort. Van Houtt. **1**: 8. 1845.

Cotyledon fulgens Baker, in Saund. Ref. Bot. 1: *pl. 64.* 1869.

Caulescent, 1–1.5 dm. high, glabrous throughout. Leaves 8–12 in a rosette, spatulate, 10 cm. long, pale glaucous-green; inflorescence paniculate, the branches 3–5 dm. long; flowers 12–20; sepals narrowly lanceolate, very unequal, spreading; corolla strongly 5-angled, coral-red without, yellowish within.

TYPE LOCALITY: Mexico.
DISTRIBUTION: Mexico.
ILLUSTRATIONS: Lemaire, Jard. Fleur. 3: *pl. 244;* Baker, *loc. cit.*

54. **Echeveria campanulata** Kunze, Delect. Sem. Hort. Lips. 1842; Linnaea **17**: 574. 1843.

Caulescent, crowned by a rosette of large leaves. Leaves spatulate, tapering at base into a thick petiole, very glaucous, obtuse at apex; inflorescence a large branching panicle; corolla strongly 5-angled; petals thick, reddish without, yellowish within, somewhat spreading at tips. Said to be near *E. gibbiflora* but certainly with very different foliage.

TYPE LOCALITY: Native of Mexico, but from what part of the country we do not know.
ILLUSTRATION: Bot. Reg. *pl. 1247*, as *E. gibbiflora*.
Mr. Hemsley in the Biologia Centrali-Americana referred this species to *Cotyledon caespitosa*, but this surely must be wrong.

55. **Echeveria gibbiflora** DC. Prodr. **3**: 401. 1828.

Echeveria grandifolia Haw. in Taylor, Philos. Mag. & Ann. 4: 262. 1828.
Echeveria grandis Morren, Belg. Hortic. 24: 161, as synonym. 1874.

Caulescent, 3–6 dm. high, glabrous throughout. Leaves 12–20 in a close rosette, obovate-spatulate, 15–17 cm. long, pale glaucous-green on both sides, becoming pinkish with age; inflorescence a lax panicle, 3–6 dm. long; branches forming secund racemes; pedicels

6–8 mm. long; sepals very unequal, widely spreading, linear; corolla strongly 5-angled, 15–25 mm. long, red without.

TYPE LOCALITY: Mexico.
DISTRIBUTION: Reported both from Mexico and South America.
ILLUSTRATIONS: Sweet, Brit. Fl. Gard. *pl. 275*; DC. Mem. Ctass. *pl. 5*.

56. **Echeveria pulchella** A. Berger, Gartenflora **53**: 206. 1904.

Acaulescent. Leaves in rather close rosette, glabrous, green, somewhat shining, oblanceolate, acute, thickish, 2–2.5 cm. long, 10–12 mm. broad; flowering stem about 1 dm. long; pedicels slender; sepals orbicular, much shorter than the corolla.

Only known from specimens grown and distributed by A. Berger, La Martola, Italy.
ILLUSTRATION: Gartenflora *loc. cit. f. 31*.

57. **Echeveria expatriata** Rose, sp. nov.

Low but distinctly caulescent, 8–10 cm. high. Stem crowned by a dense rosette of leaves and giving off new rosettes on the naked part below; leaves narrow, oblanceolate, thick but not terete in section, 2–2.5 cm. long, acute, glaucous; flowering branch ascending, rather weak, pinkish, bearing many small semiterete obtuse leaves; inflorescence at first a rather compact cyme but in age becoming more open; pedicels sometimes 12 mm. long but usually much shorter; sepals ovate, 2–3 mm. long; corolla 6 mm. long, pinkish, with a wide open mouth; stamens of two lengths.

Described from specimens obtained from the New York Botanical Garden, which flowered in Washington in June and September, 1904.

58. **Echeveria amoena** L.de Smet; Morren, Belg. Hortic. **25**: 216. 1875.

Acaulescent or nearly so, with numerous short offsets, pinkish-pruinose. Leaves in small but dense rosettes, 2 cm. long or less, 6–8 mm. wide, thick, spatulate-oblanceolate, acute; flowering branches slender, ascending, 1–2 dm. long, their tips drooping at anthesis, their leaves oblong to oblanceolate, 1 cm. long or less, blunt, readily falling away; flowers 1–8; pedicels slender, 1–2 cm. long; calyx-lobes orbicular, about 1.5 mm. broad, appressed to the base of the corolla; corolla coral-red, 8–10 mm. long, 4 mm. thick, the lobes twice as long as the tube, their tips somewhat spreading, acute.

TYPE LOCALITY: Mexico.
DISTRIBUTION: Vera Cruz.

59. **Echeveria Purpusi** Britton, sp. nov.

Caulescent, pinkish-pruinose; stem 1 dm. high or more, the flowering branches slender. Stem-leaves spatulate, thick, bluntly apiculate, 2–3 cm. long, 1–1.5 cm. wide, those of flowering branches oblong, 1 cm. long, obtuse; flowers about 5; pedicels slender, 2–3 cm. long; calyx-lobes orbicular, 2 mm. broad, not appressed to the base of the corolla; corolla yellow-pink, 8 mm. long, 5–6 mm. thick, its lobes about twice as long as the tube, their yellow tips erect, obtusish.

Between Esperanza and Orizaba, Vera Cruz, Mexico, C. A. Purpus, 1903.

UNCERTAIN AND EXCLUDED SPECIES

Echeveria discolor L.de Smet; Morren, Belg. Hortic. **24**: 159. 1874. Said to be Mexican, but it cannot be determined from the brief description.

Echeveria farinulenta Lemaire, Ill. Hortic. **11**: *sub pl. 392*. 1864. (*E. farinosa* Lemaire *loc. cit.* **10**: Misc. 83. 1863: not Lindl. 1849.) Perhaps a species of *Dudleya*.

Echeveria Funki L.de Smet; De Vos, Belg. Hortic. **27**: 169. 1877. Cannot be determined from the description.

Echeveria sobrina A. Berger, Gartenflora **53**: 206. 1904. Known to us only from the discription.

Echeveria spathulifolia L.de Smet; Morren, Belg. Hortic. **24**: 167. 1874. Probably not an *Echeveria*.

A large number of hybrid Echeverias have been produced in gardens, and described under binomials, and many unpublished garden names for other species or hybrids exist.

Konowyn N E. Ivanki Sekuw.
= E. miseno cady x Anitum x Kuna, incol

8. **OLIVERANTHUS** Rose.

Oliverella Rose, Bull. N. Y. Bot. Gard. **3**: 2. 1903. Not *Oliverella* Van Tieghem. 1895.

Caulescent and much branched perennial. Leaves flat but fleshy. Flowers usually solitary (sometimes in pairs), terminating leafy branches. Calyx-lobes unequal, linear, spreading. Corolla very large and elongated, its lobes free nearly to the base, thickish. Stamens 10. Carpels 5, free, rather short, terminated by long slender styles.

Type species, *Oliverella elegans* Rose.

1. **Oliveranthus elegans** Rose.

Oliverella elegans Rose, Bull. N. Y. Bot. Gard. **3**: 2. 1903.
Cotyledon elegans N. E. Brown, Bot. Mag. *pl. 7993*. 1905.

Caulescent, 3–5 dm. high, branching throughout, densely pubescent. Leaves closely set near the ends of young branches, gradually falling away below, oblanceolate to spatulate, thick, but flattened except at base, acute, pubescent, 2–3 cm. long; flowering branches slender, 1 dm. long, with some scattered leaves, but finally becoming naked, terminated by one or two flowers; calyx-lobes linear, spreading, very unequal, green, the longer ones 15 mm. long; corolla 2.5–3 cm. long, bright-red except the yellow tips.

TYPE LOCALITY: Cultivated at Amecameca, near the City of Mexico.
DISTRIBUTION: Mexico.
ILLUSTRATION: Bot. Mag. *loc. cit.*

9. **LENOPHYLLUM** Rose, Smithson. Misc. Coll. **47**: 159. 1904.

Perennials, branching at base. Leaves a few opposite pairs, clustered near the base, very thick, somewhat flattened, more or less deeply concave on the upper surface. Inflorescence erect, of a few equilateral racemes or interrupted spikes, or flower solitary. Calyx of 5 erect equal nearly distinct sepals. Corolla yellow or drying reddish; petals erect, only the upper portion spreading or recurved, narrowed at base and therefore not touching each other. Stamens 10, the five opposite the sepals distinct, the other five borne on the petals. Carpels narrow, erect; styles slender, at first erect, only a little spreading in age.

Type species, *Sedum guttatum* Rose.

Leaves obtuse or rounded at apex.	
Leaves broad at base.	1. *L. guttatum.*
Leaves narrow at base.	2. *L. Weinbergii.*
Leaves acute.	
Flowers solitary; plant 3–4 cm. high.	3. *L. pusillum.*
Flowers many; plant 10 cm. high or more.	
Pairs of leaves distant; corolla greenish-yellow.	4. *L. acutifolium.*
Pairs of leaves not distant; corolla "rosy yellow."	5. *L. texanum.*

1. **Lenophyllum guttatum** Rose, Smithson. Misc. Coll. **47**: 160. 1904.

Sedum guttatum Rose, Bull. N. Y. Bot. Gard. **3**: 42. 1903.

Much branched at base, short-caulescent. Leaves 2–4 pairs, glabrous, opposite, 2–3 cm. long, thickish, rounded on the back, broadly channeled on the face, of a sage-gray color blotched with purple-black, obtuse; inflorescence 3- or 4-branched; pedicels very short or wanting; sepals free nearly to the base, oblong, 3–4 mm. long, equal, green, obtuse; petals narrowly oblong, 5 mm. long, obtuse, yellow but in old flowers drying reddish, free to the base; stamens 10, shorter than the petals, the 5 opposite the sepals free to the base, the other 5 borne on the petals, attached about one-third the way up from the base; scales small, obtuse; carpels 5, distinct, erect; styles about as long as the carpels, slightly spreading in age.

TYPE LOCALITY: Summit of hill at Saltillo, Mexico.
DISTRIBUTION: Known only from the type locality.
ILLUSTRATION: Rose, Smithson. Misc. Coll. **47**: *pl. 20.*

2. **Lenophyllum Weinbergii** Britton, Smithson. Misc. Coll. **47**: 160. 1904.

Glabrous, pale-green. Plants flowering from cuttings at the height of 5 cm., and in that stage unbranched; lower leaves rhombic-obovate, very fleshy, trough-shaped, about 1.5 cm. long and 1–1.5 cm. wide, narrowed but blunt at the apex, cuneate-narrowed at

the base, opposite, ascending, the upper pair much smaller; bracts 3 mm. long or less; sepals distinct, spatulate-oblanceolate, obtuse, narrowed below, 3–4 mm. long, obtuse; petals oblanceolate, obtusish, yellow, a little longer than the sepals, erect with reflexed tips; stamens a little shorter than the petals; young carpels erect, the styles subulate.

TYPE LOCALITY: Coahuila, Mexico.
DISTRIBUTION: Known only from the type locality.
ILLUSTRATION: Britton *loc. cit. f. 18.*

3. **Lenophyllum pusillum** Rose, sp. nov.

Plants forming thick masses, probably perennial, the sterile ones 1–3 cm. high, either simple or branching at base, bearing 3–6 pairs of closely set opposite leaves. Leaves 8–16 mm. long, acute, very thick and fleshy, rounded on the back; slightly concave on the face; flowering stems 4–5 cm. long, erect, bearing many semiterete or sometimes almost hemispherical small thick leaves; flowers solitary, terminal; sepals green, narrow, fleshy, acute; petals lemon-yellow, 6–7 mm. long, oblong, slightly narrowed at base, erect below the tips of the sepals, spreading above, obtuse, but with a pronounced mucro on the back just below the tip; stamens 10, of two lengths, exserted; carpels erect.

Described from living plants grown in the succulent house of the Department of Agriculture, which flowered in November, 1904 (Rose *no. 11027*). The exact origin of this plant is uncertain but it is doubtless from northern Mexico. Our material was obtained from Mr. Frank Weinberg, of Woodside, Long Island, who had procured seeds of *Urbinia agavoides* from Laredo, Texas, with which were several seeds of this species.

Four specimens of this plant have flowered, all of which have a single terminal flower, but as these specimens are not in the best of condition this character may not be normal. The plant readily sheds its leaves, which quickly take root and soon form a great mass of small plants.

4. **Lenophyllum acutifolium** Rose, Smithson. Misc. Coll. **47**: 162. 1904.

Perennial, much branched at base. Leaves opposite, 6–8 pairs, thickish, deeply channeled above, acute; flowers scattered in an interrupted spike or equilateral raceme, sessile or subsessile, borne in the axils of small bracts; sepals subequal, thickish, acute; petals greenish-yellow, distinct, erect below, spreading or reflexed above, acute; the 5 stamens opposite the sepals distinct, the other five borne on the petals; scales broad, truncate at apex; carpels erect; styles slender.

TYPE LOCALITY: Monterey, Mexico.
DISTRIBUTION: Known only from the type locality.
ILLUSTRATION: Rose *loc. cit. f. 19.*

5. **Lenophyllum texanum** (J. G. Smith) Rose, Smithson. Misc. Coll. **47**: 162. 1904.

Sedum texanum J. G. Smith, Rep. Mo. Bot. Gard. 6: 114. 1895.
Villadia texana Rose, Bull. N. Y. Bot. Gard. 3: 3. 1903.

Herbaceous, 1–2 dm. high, branching near the base. Leaves opposite, described as thick, fleshy, obovate to ovate-lanceolate; inflorescence a spike-like equilateral raceme or somewhat paniculate; flowers subsessile; sepals lanceolate, 2–3 mm. long, acute; petals distinct (?), 4–5 mm. long, oblong, acute, reddish; carpels erect, long-acuminate.

TYPE LOCALITY: Near Corpus Christi, Texas.
DISTRIBUTION: Known only from the type locality.
ILLUSTRATION: J. G. Smith *loc. cit. pl. 50.*

10. **CORYNEPHYLLUM** Rose, gen. nov.

Caulescent, much branched, the stems becoming woody. Leaves club-shaped, terete in cross-section, obtuse. Flowers axillary, sessile; bracts 2, leaf-like. Calyx-lobes distinct or nearly so, the two lower and one upper much enlarged, longer than the corolla, the two lateral ones nearly equal, but small, much shorter than the corolla. Corolla small, greenish-yellow; petals erect, distinct. Stamens 10, the 5 alternating with the petals free, a little longer than the corolla, the other five borne on the petals, and shorter than they, not appendaged at base. Glands broad, yellow. Ovaries erect; ovules numerous.

1. **Corynephyllum viride** Rose, sp. nov.

Stems 30–40 cm. high. Leaves closely set upon the branches, spreading almost at right angles to them, 3–5 cm. long, slightly glaucous.

Collected by C. A. Purpus in eastern Mexico in 1904; flowered in Washington, D. C., March, 1905 (Rose *no. 952*).

11. **CLEMENTSIA** Rose, Bull. N. Y. Bot. Gard. 3: 3. 1903.

Perennial herb with an elongated rootstock, and usually with several stems from the base. Stem-leaves numerous. Flowers in a more or less elongated dense spike or raceme. Calyx-segments linear to linear-lanceolate. Petals distinct, rose-colored. Stamens 10, 5 alternating with the petals and distinct; 5 opposite the petals and each adnate to its corresponding petal near the middle. Scales 5, prominent, flat, obtuse. Carpels 5, erect.

Type species, *Sedum rhodanthum* A. Gray.

1. **Clementsia rhodantha** (A. Gray) Rose, Bull. N. Y. Bot. Gard. 3: 3. 1903.

Sedum rhodanthum A. Gray, Am. Jour. Sci. II. **33**: 405. 1862.

Glabrous; stems several or numerous from a thick rootstock, simple, stout, 1.5–3.5 dm. tall. Leaves linear-oblong to oblanceolate, sessile, numerous, scattered, 1.5–3 cm. long, entire or few-toothed, acutish or blunt; raceme thyrsoid, usually longer than broad, very dense, sometimes 6 cm. long; pedicels 1–3 mm. long; calyx-segments linear to linear-lanceolate, acuminate, 4–6 mm. long; petals rose-colored to white, linear-lanceolate, about twice as long as the calyx; stamens nearly as long as the petals, adnate to them below the middle; follicles erect, their subulate tips slightly spreading.

TYPE LOCALITY: High alpine region of the Rocky Mountains.
DISTRIBUTION: Meadows and along streams in the Rocky Mountains, Arizona and Utah to Montana.

12. **VILLADIA** Rose, Bull. N. Y. Bot. Gard. 3: 3. 1903.

Perennial by fleshy or somewhat tuberous roots; caulescent. Leaves terete and turgid. Inflorescence an equilateral raceme, spike or very compact panicle. Flowers small. Sepals 5, nearly equal. Corolla not 5-angled, its segments thin, united into a short but distinct tube. Stamens 10; anthers broad and short. Scales conspicuous, thin. Carpels erect; styles very short.

Type species, *Cotyledon parviflora* Hemsl.

Leaves closely imbricated. — 1. *V. imbricata.*
Leaves often closely set but not imbricated.
  Corolla-segments hooded. — 2. *V. cucullata.*
  Corolla-segments not hooded.
    Style wanting or indefinite. — 3. *V. Painteri.*
    Style very definite.
      Corolla-segments pure white.
        Branches roughened. — 4. *V. Nelsoni.*
        Branches not roughened.
          Leaves ovate-oblong. — 5. *V. albiflora.*
          Leaves linear.
            Corolla-segments 6 mm. long; styles slender. — 6. *V. Pringlei.*
            Corolla-segments 3 mm. long; styles short. — 7. *V. stricta.*
      Corolla-segments not pure white.
        Stems and leaves pubescent. — 8. *V. minutiflora.*
        Stems and leaves not pubescent.
          Corolla-segments obtuse. — 9. *V. ramosissima.*
          Corolla-segments acute.
            Scales greatly enlarged. — 10. *V. squamulosa.*
            Scales not greatly enlarged. — 11. *V. parviflora.*

1. **Villadia imbricata** Rose, Bull. N. Y. Bot. Gard. 3: 3. 1903.

Cespitose; sterile branches thickly set with small ovate imbricated leaves. Flowering branches 2–6 cm. long, thickly set with imbricated leaves; leaves oval, 3 mm. long, acute, keeled on the back, at least in dry specimens, very pale, thickly set with minute tubercles; inflorescence a very short compact leafy spike; sepals distinct, leaf-like, shorter than the

corolla; corolla "white," 4–5 mm. long; its lobes erect, united for about one-third their length at base.

TYPE LOCALITY: Near Reyes, Oaxaca, Mexico.
DISTRIBUTION: Known only from the type locality.

2. **Villadia cucullata** Rose, Bull. N. Y. Bot. Gard. 3: 4. 1903.

Perennial from very fleshy tuberous roots; stems strict, 1–3 dm. high, glabrous, reddish, in herbarium specimens spotted; leaves numerous, ascending, nearly terete, acuminate, 2–2.5 cm. long, glabrous, projecting backward at base; inflorescence an interrupted spike becoming 10–15 cm. long in fruit; flowers subtended by small ovate bracts; sepals ovate, green, 2 cm. long, distinct; corolla reddish or orange-colored, 3 mm. long; tube 1 mm. long; lobes cucullate, denticulate on the margin. The peculiar tapering leaves, orange-colored corolla and hooded petals are the striking characteristics of this very interesting species.

TYPE LOCALITY: Saltillo, Coahuila, Mexico.
DISTRIBUTION: Type locality and vicinity.

3. **Villadia Painteri** Rose, sp. nov.

Perennial with a short woody base and with several short erect dark bluish-green branches; glabrous. Leaves numerous, terete, narrowed downward from near the apex and thus club-shaped, obtuse, very pale; inflorescence a strict interrupted spike or in vigorous plants somewhat panicled, 4–10 cm. long; sepals green, 2 mm. long; corolla drying pinkish and little longer than the calyx, its lobes obtuse; carpels without styles, but acutish.

Collected by J. N. Rose and J. H. Painter in the barranca of Guadalajara, September 28, 1903 (*no. 7424*, type), and by C. G. Pringle at the same station and date (*no. 11815*).

This species is of the *V. parviflora* type but the leaves are of different shape, the petals smaller and more blunt; when living it can easily be distinguished by its dark-green color.

4. **Villadia Nelsoni** Rose, Bull. N. Y. Bot. Gard. 3: 4. 1903.

Caulescent, 2–3 dm. high, more or less branched throughout, somewhat roughened. Leaves spatulate, flattened (at least in dried specimens), 1–1.5 cm. long; inflorescence spicate; flowers sessile; sepals ovate, 2 mm. long; corolla "white," 5–6 mm. long; carpels long-attenuate. A peculiar species, perhaps not belonging to this genus.

TYPE LOCALITY: Between Ayusinapa and Petatlan, Guerrero, Mexico.
DISTRIBUTION: Known only from the type locality.

5. **Villadia albiflora** (Hemsl.) Rose.

Cotyledon albiflora Hemsl. Diag. Pl. Nov. 1: 9. 1878.

Herbaceous, caulescent, glabrous. Stem-leaves small, ovate-oblong, obtuse, thickish; inflorescence spicate-paniculate; flowers small, sessile or nearly so; sepals distinct, equal, obtuse, 2–3 mm. long; corolla white, 5–6 mm. long, its lobes unequal. The above description is compiled, as this species is only known from the type specimen, which we have not seen.

TYPE LOCALITY: Mountains of Oaxaca, Mexico.
DISTRIBUTION: Known only from the type locality.

6. **Villadia Pringlei** Rose, Bull. N. Y. Bot. Gard. 3: 4. 1903.

Perennial by fleshy roots, much branched at base. Stems 5–15 cm. high, green; stem-leaves linear in outline, 1–1.5 cm. long; inflorescence sometimes 1 dm. long, either spicate, or a compact panicle; sepals somewhat unequal, distinct, the longer ones 5 mm. long; corolla white (?), 6 mm. long.

TYPE LOCALITY: Dry ledges in the Sierra Madre, Chihuahua, Mexico.
DISTRIBUTION: Known only from the type locality.

7. **Villadia stricta** Rose, sp. nov.

Perennial, erect, 1–2 dm. high, forming short compact rosettes at base, glabrous, rather pale-green. Leaves rather closely set, ascending, terete, obtuse; inflorescence an elongated spike; bracts small, leaf-like; flowers sessile; sepals green, obtuse, about half as long as

Durango (De Lauriere), 1904; # 21918 U.C.M.A.

the corolla; petals white, in old specimens becoming reddish, broad and obtuse but with a small tip below the apex, 3 mm. long; stamens about two-thirds the length of the corolla; styles short; scales rather prominent.

Collected by Dr. E. Palmer at Concepcion del Oro, Zacatecas, in 1902 (*no. 512*, type) and in 1904 (*no. 449*). Both specimens have flowered in Washington.

Perhaps nearest *V. Pringlei*, but with much smaller flowers.

8. **Villadia minutiflora** Rose, Bull. N. Y. Bot. Gard. **3**: 4. 1903.

Perennial, with a woody or frutescent base, sending up from below numerous simple ascending or erect branches 1–2 dm. tall, terminating in an open spike or raceme, or a very narrow compact panicle. Leaves very numerous, ascending, linear in outline, perhaps turgid and terete in fresh specimens, 6–10 mm. long, about 1 mm. wide, obtuse, projecting below the insertion at base, pubescent with short stiff hairs; flowers sessile or subsessile, either solitary and axillary or borne in short one-sided spikes; sepals somewhat unequal, 1–2 mm. long, distinct; corolla white, 3 mm. long, its segments united at base; stamens shorter, borne on the corolla-tube; appendages rounded at apex, produced below into a slender stalk; carpels erect, short; styles short, spreading or even hooked.

TYPE LOCALITY: Sierre de San Felipe, Oaxaca, Mexico.
DISTRIBUTION: Known only from the type locality.

9. **Villadia ramosissima** Rose, Bull. N. Y. Bot. Gard. **3**: 5. 1903.

Shrubby and much branched at base, the branches reddish, glabrous, at first erect, but in age spreading over other plants. Leaves rigid, set nearly at right angles to the stems, turgid and nearly terete, in section ovate to oblong, glabrous; sterile branches short and closely covered with pale-gray or purplish leaves; inflorescence a loose leafy spike, each flower borne in the axil of a leaf and with a smaller leaf on each side; sepals green, distinct, ovate, acute, 2 mm. long; corolla campanulate, white or with a pinkish tinge (in cultivated specimens), its tube short, but very distinct, the lobes acute, 4 mm. long; stamens 10, borne on the corolla-tube, much shorter than the petals; anthers purplish; appendages conspicuous and yellow, 1 mm. broad; carpels erect (at least when young), distinct.

TYPE LOCALITY: Limestone hills near Tehuacan, Puebla, Mexico.
DISTRIBUTION: Puebla; Oaxaca.

10. **Villadia squamulosa** (S. Wats.) Rose, Bull. N. Y. Bot. Gard. **3**: 5. 1903.

Cotyledon parviflora squamulosa S. Wats. Proc. Am. Acad. **22**: 473. 1887.
Sedum squamulosum S. Wats. *loc. cit.* as synonym.

Perennial, glabrous throughout. Stems slender, branching at base, erect or ascending, 1–1.5 dm. long; leaves linear, 1–1.5 cm. long; flowers sessile or short-pedicelled, either single and axillary, or in small clusters; corolla-segments rose-colored, ovate, acute, 2–3 mm. long, about twice as long as the sepals; appendages very large, yellow, 1 mm. long or more, thickened above.

TYPE LOCALITY: Potrero and Mapula Mountains, twenty miles south of Chihuahua, Mexico.
DISTRIBUTION: Chihuahua.

11. **Villadia parviflora** (Hemsl.) Rose, Bull. N. Y. Bot. Gard. **3**: 5. 1903.

Cotyledon parviflora Hemsl. Diag. Pl. Nov. 1: 9. 1878.

Perennial by somewhat fleshy roots. Stems herbaceous, very strict, in flower somewhat nodding at the tips, more or less branching at base, in large plants sometimes branching near the middle, the branches also erect, leafy to the base; leaves erect, closely set and overlapping, terete above, semi-terete below, acute, at base slightly projecting below the insertion; inflorescence like an interrupted leafy spike, each leaf subtending 1–3 flowers; sepals equal, green, slightly roughened; corolla white tinged with red, its segments erect,

acute, angled on the back, united for about one-half their length; stamens included, borne on the corolla-tube; styles very short; carpels short and thick, erect except at tip, free to base.

TYPE LOCALITY: Mt. Zacoalco, Valley of Mexico.
DISTRIBUTION: High valleys of central Mexico.

13. **URBINIA** Rose, Bull. N. Y. Bot Gard. 3: 11. 1903.

Acaulescent or caulescent. Leaves closely imbricate, thick and rigid. Inflorescence rather few-flowered, cymose. Calyx small, 5-lobed; lobes ovate to lanceolate, equal or unequal, much shorter than the corolla. Corolla somewhat cone-shaped, the lobes united at base into a tube. Stamens 10, borne on the corolla. Carpels 5.

Type species, *Echeveria agavoides* Lemaire.

Calyx-segments ovate; flowers 8 or fewer. — 1. *U. agavoides.*
Calyx-segments lanceolate.
  Leaves of flowering stem small, scarious. — 2. *U. Corderoyi.*
  Leaves of flowering stem large, foliaceous. — 3. *U. obscura.*

1. **Urbinia agavoides** (Lemaire) Rose, Bull. N. Y. Bot. Gard. 3: 12. 1903.

Echeveria agavoides Lemaire, Ill. Hortic. 10: Misc. 78. 1863.
Cotyledon agavoides Baker in Saund. Ref. Bot. 1: *pl. 67.* 1869.

Plants with a short thick caudex. Leaves in a dense rosette, ovate, acute, 3–5 cm. long, very rigid and spine-tipped; flowering branches slender and weak, 2–3 dm. long, few-flowered; calyx small, spreading, with 5 small ovate lobes; corolla cone-shaped, the yellow tips spreading, the base terete and red, the segments united for one-fourth their length; stamens all borne on the corolla, attached above its base.

TYPE LOCALITY: Mexico.
DISTRIBUTION: Mexico.
ILLUSTRATIONS: Baker, *loc. cit.;* Gard. Mag. 1873: 237; Fl. des Serres 19: *pl. 2003.*

2. **Urbinia Corderoyi** (Baker) Rose, Bull. N. Y. Bot. Gard. 3: 12. 1903.

Cotyledon Corderoyi Baker, Gard. Chron. II. 1: 599. 1874.
Echeveria Corderoyi Morren, Belg. Hortic. 24. 159. 1874.

Acaulescent, glabrous throughout. Leaves 60–70, in a dense rosette, 5–7 cm. long, very thick; flowering branches 15–20-flowered; calyx rotate; corolla 18 mm. long, red at base, yellow above. Very near *E. agavoides*, but described as having more leaves and flowers.

TYPE LOCALITY: Not cited.
DISTRIBUTION: Northern Mexico.

3. **Urbinia obscura** Rose, Bull. N. Y. Bot. Gard. 3: 12. 1903.

Caulescent; stem 1 dm. high, 2–3 cm. thick. Leaves ovate, 8–9 cm. long, 4–5 cm. broad at base, thick but flattened, somewhat rounded at the base; flowering stems thickish, covered with many narrow leaves, the larger ones 3 cm. long, free at base, green except the pungent almost spiny tip; inflorescence a two-branched raceme; flowers about 10; calyx small with 5 very unequal lanceolate teeth; corolla 12 mm. long, bright rose-colored below, but the slightly spreading lobes yellow.

TYPE LOCALITY: Unknown. Species described from a living specimen in collections of the New York Botanical Garden.

14. **COURANTIA** Lemaire, Jard. Fleur. 1: Misc. 92. 1851.

Caulescent. Leaves alternate, closely set, flat and broad. Inflorescence a dense spike; bracts brightly colored. Calyx-lobes equal (?), linear, brightly colored, as long as the corolla. Corolla not 5-angled, yellow, 5-parted. Stamens 10, borne at base of the corolla; filaments united into a tube for half their length; scales none (?). Carpels widely spreading.

Type species, *Echeveria rosea* Lindl.

See Nelson & Mae Ande
Rock. Hag. 56: 476-7
for hymenophyes

1. **Courantia rosea** (Lindl.) Lemaire; Britton & Rose, Bull. N. Y. Bot. Gard. 3: 11. 1903.

Echeveria rosea Lindl. Bot. Reg. 28: *pl. 22.* 1842.
Cotyledon roseata Baker, in Saund. Ref. Bot. 1: sub *pl. 55*, no. 3. 1869.
Courantia echeverioides Lemaire, Jard. Fleur. 1: Misc. 92. 1851.

Caulescent, branching, 10–30 cm. high, glabrous. Leaves numerous, closely set near apex of the branches, oblanceolate-spatulate, sometimes 7.5 cm. long, the margins reddish-tinged; flowering branches 10 cm. long, stout, densely leafy, the lower leaves spatulate, the upper ones linear, as long as the flowers, all tinged with red; flowers many, in a dense spike; calyx-lobes linear, rose-red, the longer ones as long as the corolla; corolla pale-yellow.

TYPE LOCALITY: Mexico.
DISTRIBUTION: San Luis Potosi to Oaxaca and Vera Cruz.
ILLUSTRATION: Lindley, *loc. cit.*

15. DUDLEYA Britton & Rose, Bull. N. Y. Bot. Gard. 3: 12. 1903.

Caulescent or acaulescent perennials with flat linear to ovate basal leaves, and yellow, orange, red or rarely white flowers mostly in panicles. Leaves of the flowering branches usually much shorter and relatively broader than the basal ones, sessile or clasping. Calyx conspicuous, 5-lobed, the lobes erect, linear-lanceolate to ovate, obtuse to acuminate. Corolla nearly cylindric, or somewhat angled, the segments united below the middle, erect, or their tips somewhat spreading, obtuse to acuminate. Stamens twice as many as the calyx-lobes, distinct. Carpels erect, many-seeded.

Type species, *Echeveria lanceolata* Nutt.

1. Leaves papillose; corolla coral-red; calyx-segments oblong, obtuse. — 1. *D. Rusbyi.*
2. Leaves not papillose; corolla yellow to orange or red, rarely white.
   A. Corolla white. — 2. *D. albiflora.*
   B. Corolla yellow, orange or red.
      a. Pedicels filiform, spreading; leaves of flowering branches nearly orbicular.
         Calyx-segments triangular-lanceolate. — 3. *D. pulverulenta.*
         Calyx-segments very narrow, linear-lanceolate. — 4. *D. Anthonyi.*
      b. Pedicels stout or slender, not spreading; leaves of flowering branches ovate to linear-lanceolate.
         * Calyx-segments lanceolate to triangular-lanceolate (ovate in no. 14).
            † Calyx-segments acute to obtuse, not acuminate.
               ‡ Corolla dull red to pink.
                  Corolla-lobes about as long as the tube. — 5. *D. tenuis.*
                  Corolla-lobes twice as long as the tube or more.
                     Basal leaves elongated, lanceolate to linear-lanceolate.
                        Pedicels slender; leaves lanceolate.
                           Leaves very glaucous. — 6. *D. angustiflora.*
                           Leaves green, shining. — 7. *D. reflexa.*
                        Pedicels short or wanting; leaves narrow. — 8. *D. Abramsi.*
                     Basal leaves short, ovate. — 9. *D. pumila.*
               ‡‡ Corolla yellow.
                  ° Calyx-segments broadly triangular-lanceolate.
                     Pedicels slender; United States species.
                        Leaves of flowering branches deeply sagittate; basal leaves white-farinose. — 10. *D. farinosa.*
                        Leaves of flowering branches not sagittate.
                           Leaves linear, semiterete. — 11. *D. aloides.*
                           Leaves lanceolate to triangular-lanceolate, flat.
                              Corolla 1 cm. long or less.
                                 Pedicels as long as the flowers. — 12. *D. saxosa.*
                                 Pedicels little if any longer than the calyx. — 13. *D. Setchellii.*
                              Corolla 1.5 cm. long. — 14. *D. grandiflora.*
         Pedicels very short, stout.
            Leaves broadly linear.
               Leaves green, not farinose.
                  Corolla-tube shorter than the calyx; inflorescence somewhat elongated. — 15. *D. linearis.*
                  Corolla-tube longer than the calyx; inflorescence rather compact. — 16. *D. cultrata.*
               Leaves farinose or glaucous.
                  Leaves of flowering stems acuminate; corolla 8–10 mm. long. — 17. *D. Greenei.*
                  Leaves of flowering stems acute; corolla 15 mm. long. — 18. *D. Hallii.*
            Leaves triangular-lanceolate, elongated. — 19. *D. Candelabrum.*

°° Calyx-segments linear-lanceolate, nearly 4 times as long as wide.
Leaves broadly oblong, pale-green.
Inflorescence compact; leaves of flowering stems small. 20. *D. Bryceae.*
Inflorescence open; leaves of flowering stems large. 21. *D. ingens.*
Leaves linear-oblong, white-farinose. 22. *D. candida.*
†† Calyx-segments acuminate. 23. *D. rigidiflora.*
** Calyx-segments ovate, ovate-lanceolate or triangular-ovate.
† Pedicels slender, some of them often as long as the flowers or longer.
‡ Flowers yellow to orange or pinkish.
Basal leaves ovate, rhombic-ovate or rhombic-obovate, acute to acuminate.
Leaves of flowering branches cordate to sagittate.
Corolla twice as long as the calyx.
Leaves of flowering branches cordate. 24. *D. laxa.*
Leaves of flowering branches strongly sagittate. 25. *D. bernardina.*
Corolla three times as long as the calyx.
Flowers few, pinkish or deep-orange. 26. *D. Goldmani.*
Flowers numerous, pale-orange to yellow. 27. *D. minor.*
Leaves of flowering branches neither cordate nor sagittate.
Leaves of flowering branches small, ovate. 28. *D. ovatifolia.*
Leaves of flowering branches lanceolate to linear-lanceolate.
Leaves thick, dark-green, not glaucous. 29. *D. nevadensis.*
Leaves thin, pale-green, glaucous.
Leaves oblanceolate, long-acuminate. 30. *D. Plattiana.*
Leaves rhomboid, abruptly acuminate.
Flowers reddish-orange. 31. *D. Purpusi.*
Flowers bright-yellow. 32. *D. Sheldoni.*
Basal leaves lanceolate to oblong-lanceolate, acuminate.
Calyx and pedicels very glaucous or farinose; leaves of flowering branches 3–4 cm. long. 33. *D. robusta.*
Calyx and pedicels green; leaves of flowering branches small.
Pedicels short; leaves weak.
Flowers orange. 34. *D. Parishii.*
Flowers yellow. 35. *D. cymosa.*
Pedicels long; leaves rigid.
Calyx-segments ovate-lanceolate; basal leaves glaucous. 36. *D. Brandegei.*
Calyx-segments ovate; basal leaves light green, shining. 37. *D. lurida.*
‡‡ Flowers red.
Flowers small, 8 mm. long.
Inflorescence flat-topped. 38. *D. pauciflora.*
Inflorescence elongated, one-sided.
Calyx-segments acute. 39. *D. nubigena.*
Calyx-segments obtuse. 40. *D. Xanti.*
Flowers large, 10–12 mm. long.
Calyx-segments sharply acuminate. 41. *D. rubens.*
Calyx-segments obtuse or merely acutish.
Inflorescence many-branched; caudex stout, erect. 42. *D. gigantea.*
Inflorescence simple or forked; flowering branches long, ascending. 43. *D. rigida.*
†† Pedicels stout, short, mostly shorter than the flowers.
‡ Leaves lanceolate to ovate.
Leaves long-lanceolate, acuminate.
Leaves glaucous.
Corolla reddish-yellow. 44. *D. lanceolata.*
Corolla deep-yellow. 45. *D. delicata.*
Leaves not glaucous; corolla lemon-yellow.
Pedicels 6–12 mm. long. 46. *D. Palmeri.*
Pedicels very stout, 1.5–4 mm. long.
Corolla pale-yellow; leaves dull-green. 47. *D. Brauntoni.*
Corolla reddish-yellow; leaves bright-green. 48. *D. brevipes.*
Leaves ovate, ovate-oblong or oblong-lanceolate, acute.
Leaves not glaucous.
Inflorescence compact.
Corolla-segments acute.
Basal leaves oblong-lanceolate, acute; those of flowering branches cordate, ovate. 49. *D. compacta.*
Basal leaves rhombic-lanceolate, acuminate; those of flowering branches triangular. 50. *D. congesta.*
Corolla-segments obtuse. 51. *D. Eastwoodiae.*
Branches of the inflorescence elongated.
Leaves of flowering branches strongly sagittate

Graptopetalum Ruralyi (greene) Rose
Addisonia 9:31 pl. 304. 1924

3 a.- Dudleya arizonica Rose
Addisonia - Pl. 274

Arizona

at the base; basal leaves acuminate; Lower Californian. 52. *D. acuminata.*
Leaves of flowering branches not strongly sagittate; basal leaves acute: central Californian. 53. *D. Lingula.*
Leaves glaucous.
Corolla-lobes obtuse. 54. *D. septentrionalis.*
Corolla-lobes acute.
Inflorescence paniculate.
Inflorescence elongated, many-flowered. 55. *D. paniculata.*
Inflorescence short, few-flowered. 56. *D. humilis.*
Inflorescence cymose.
Leaves lingulate. 57. *D. caespitosa.*
Leaves linear-lanceolate.
Inflorescence compact; branches short. 58. *D. Helleri.*
Inflorescence open: branches elongated. 59. *D. Cotyledon.*
‡‡ Leaves narrow, nearly linear. 60. *D. elongata.*

1. **Dudleya Rusbyi** (Greene) Britton & Rose, Bull. N. Y. Bot. Gard. 3: 13. 1903.

Cotyledon Rusbyi Greene, Bull. Torrey Club 10: 125. 1883.

Probably perennial, acaulescent. Leaves in dense rosettes, rhomboid-ovate, 1.5–2 cm. long, acuminate, glabrous but papillose-roughened; flowering branches erect, 7–12 cm. high, glabrous; leaves of flowering stems linear, scattered and small; inflorescence a two-branched few-flowered cyme; pedicels 2–6 mm. long; calyx-lobes somewhat unequal, ovate, obtuse or acute; corolla deep-red or "coral-red," 10 mm. long, the acuminate lobes united into a tube longer than the calyx. A very rare and interesting species, perhaps not properly referable to this genus.

TYPE LOCALITY: Near Prescott, Arizona.
DISTRIBUTION: Arizona.

2. **Dudleya albiflora** Rose, Bull. N. Y. Bot. Gard. 3: 13. 1903.

Perennial by a multicipital caudex 2–3 dm. in diameter and with 25 rosettes or more crowning the short stems. Leaves narrow, 1–1.5 cm. broad, strap-shaped to lanceolate, 4–5 cm. long, becoming purplish, not glaucous, thick and fleshy but distinctly flattened, acute; corolla white.

TYPE LOCALITY: Magdalena Bay, Lower California.
DISTRIBUTION: Known only from the type locality.

3. **Dudleya pulverulenta** (Nutt.) Britton & Rose, Bull. N. Y. Bot. Gard. 3: 13. 1903.

Echeveria pulverulenta Nutt.; T. & G. Fl. N. Am. 1: 560. 1840.
Echeveria argentea Lemaire, Ill. Hortic. 10: Misc. 78. 1863.

Rootstock short, thick; plant mealy-pulverulent all over. Flowering stems stout, 8 dm. high or less; basal leaves numerous, spreading, flaccid, 1.5 dm. long or less, 5–9 cm. wide, broadly spatulate to obovate-spatulate, acute to acuminate; leaves of the flowering stems numerous, broadly ovate, deeply cordate-clasping, acute, or the lower ones ovate and acuminate; inflorescence of two or several ascending racemes 1–3 dm. long; pedicels very slender, 8–18 mm. long, nearly horizontal, the flowers erect or ascending; flowers about 1.5 cm. long; calyx-segments lanceolate to ovate-lanceolate, about 5 mm. long, acute; corolla red, its lobes acute, united to about the middle; carpels narrow, distinct or nearly so, erect.

TYPE LOCALITY: San Diego, California.
DISTRIBUTION: Southern California.

4. **Dudleya Anthonyi** Rose, Bull. N. Y. Bot. Gard. 3: 13. 1903.

Resembling *D. pulverulenta*, but basal leaves more elongated, 2 dm. long by 4–5 cm. broad; stem-leaves seemingly narrower; pedicels slender and longer, and calyx-lobes narrower.

TYPE LOCALITY: San Martin Island, Lower California.
DISTRIBUTION: Known only from the type locality.

5. **Dudleya tenuis** Rose, Bull. N. Y. Bot. Gard. **3**: 14. 1903.

Acaulescent. Leaves forming a rosette, oblong-lanceolate, 3–4 cm. long, acuminate, somewhat glaucous; flowering stems slender, 1–2 dm. high; inflorescence a slender panicle, consisting of several elongated erect branches; pedicels very short, 1 mm. long or less; calyx deeply 5-parted, its lobes broadly lanceolate, acute, 2–2.5 mm. long; corolla 6–8 mm. long, narrow, at first yellowish, in age becoming reddish, the segments united for about one-half their length.

TYPE LOCALITY: Mountains of Lower California.
DISTRIBUTION: Known only from the type locality.

6. **Dudleya angustiflora** Rose, Bull. N. Y. Bot. Gard. **3**: 14. 1903.

Acaulescent. Leaves forming a rosette, lanceolate, 3–4 cm. long, acute or acuminate, very glaucous; flowering stems slender, 1.5–2 dm. high; inflorescence a somewhat spreading panicle with 2–4 elongated branches; pedicels slender, 4–12 mm. long; calyx glaucous, deeply 5-parted; its lobes broadly lanceolate, acute, 3 mm. long; corolla very narrow, 10–12 mm. long, reddish (at least drying so), its segments united into a tube 2 mm. long; stamens about two-thirds as long as the corolla, borne on its tube; carpels erect.

TYPE LOCALITY: Daunt, Tulare County, California.
DISTRIBUTION: Known only from the type locality.

7. **Dudleya reflexa** Britton, sp. nov.

Acaulescent, the basal leaves numerous, narrowly oblong-lanceolate, 7 or 8 cm. long, about 1.5 cm. wide, spreading, bright-green and shining, not at all glaucous. Flowering stems stout, weak, about 2 dm. long, their leaves triangular-lanceolate, sagittate, 2 cm. long or less, the lower strongly reflexed, the upper shorter and broader, triangular-ovate, spreading or reflexed; inflorescence of three one-sided racemes, each forked, 1–1.5 dm. long, recurved, stout, light-green; pedicels stout, 1.5 cm. long or less; calyx about 8 mm. long, 5-cleft, the lobes narrowly lanceolate, acute, twice as long as the tube, green and shining; corolla 15–18 mm. long, light-red to pink, its segments lanceolate, acuminate, about 4 times as long as the tube; stamens about three-fourths as long as the corolla, a little shorter than the erect pistils, which are separate to the base.

Southern California, sent by Miss Mary T. Bryce in 1902; flowered at the New York Botanical Garden, November, 1903.

8. **Dudleya Abramsi** Rose, Bull. N. Y. Bot. Gard. **3**: 14. 1903.

A very delicate little perennial with a thick caudex crowned by a dense rosette of small (2 cm. long) linear-ovate, acuminate, somewhat glaucous leaves. Flowering stems slender, 6–7 cm. long, naked below, and with a few scattered ovate acute bracts above; inflorescence 2-branched (in two specimens seen), each branch bearing a secund raceme of several subsessile flowers; calyx 3 mm. long, its lobes triangular-lanceolate, acute, about twice as long as the tube; corolla slender, 8–9 mm. long, the tube longer than the calyx, the lobes narrow, acute, yellow, striped on the back with deep-red, much longer than the slender styles and stamens.

TYPE LOCALITY: Crevices of rocks, west of Jacumba, San Diego County, California.
DISTRIBUTION: Known only from the type locality.

9. **Dudleya pumila** Rose, Bull. N. Y. Bot. Gard. **3**: 14. 1903.

Acaulescent. Leaves forming small dense rosettes, very glaucous, 2–3 cm. long, ovate, acute; flowering stems delicate, less than 1 cm. long, bearing small ovate leaves; inflorescence of 2 or 3 slender branches, ascending or spreading; pedicels 6–10 mm. long; calyx pale, glaucous, its lobes lanceolate-ovate, 2–3 cm. long, acute or sometimes obtusish; corolla 10–13 mm. long, the lobes very narrow, acute, much longer than the stamens.

TYPE LOCALITY: San Bernardino Mountains, California.
DISTRIBUTION: Known only from the type locality.

10. **Dudleya farinosa** (Lindl.) Britton & Rose, Bull. N. Y. Bot. Gard. 3 : 15. 1903.

Echeveria farinosa Lindl. Jour. Hort. Soc. London 4 : 292. 1849.
Cotyledon farinosa Baker, in Saund. Ref. Bot. 1 : *pl. 71.* 1869.

Rootstock short; flowering stems low, rather stout. Basal leaves tufted, lingulate, acute, flat, white-mealy; leaves of the flowering stems triangular, concave, deeply sagittate, small, the basal lobes turned upward; cymes rather loose; pedicels slender; calyx-segments broadly lanceolate; corolla lemon-yellow.

TYPE LOCALITY: Rocks near Carmel Bay, California.
DISTRIBUTION: Coast of California.
ILLUSTRATION: Baker, *loc. cit.*

11. **Dudleya aloides** Rose, Bull. N. Y. Bot. Gard. 3 : 15. 1903.

Tufted, acaulescent. Leaves numerous, erect, rigid, very narrow, thick, semiterete, or the upper part subterete, 7–12 cm. long, 10–15 mm. broad at base, gradually tapering to the apex, very pale, hardly glaucous, often spotted with red; flowering stems 2–3 dm. long, reddish, as also the branches and pedicels; stem-leaves ovate, acute, slightly clasping; inflorescence paniculate; pedicels rather slender, 18–20 mm. long, ascending; calyx deeply 5-cleft, the lobes triangular-lanceolate, 4 mm. long, acute; corolla broad, yellow, 10 mm. long, the lobes acute.

TYPE LOCALITY: San Felipe, San Diego County, California.
DISTRIBUTION: Southern California.

12. **Dudleya saxosa** (M. E. Jones) Britton & Rose, Bull. N. Y. Bot. Gard. 3 : 15. 1903.

Cotyledon saxosum M. E. Jones, Contr. West. Botany 8 : 28. 1898.

Tufted, acaulescent. Leaves numerous, fleshy and semiterete in living specimens, in dried specimens flattened and apiculate, very narrow, 2.5–8 cm. long, green or somewhat glaucous when young; flowering stems 10–25 cm. long, reddish, their leaves ovate-linear, a little clasping at base; pedicels 10-12 mm. long, erect; calyx deeply 5-parted, 5–8 mm. long, the lobes lanceolate to ovate-lanceolate; corolla 10–12 mm. long, at first yellowish but drying reddish, the lobes rather broad and acute.

TYPE LOCALITY: Panamint Cañon, California.
DISTRIBUTION: Panamint mountains of southern California.

13. **Dudleya Setchellii** (Jepson) Britton & Rose, Bull. N. Y. Bot. Gard. 3 : 15. 1903.

Cotyledon laxa Setchellii Jepson, Fl. West. Middle Calif. 267. 1901.

Flowering stems numerous, from the crown of a short thick caudex, about 3 dm. high. Leaves very glaucous, numerous, lanceolate to linear-lanceolate, long-acuminate; leaves of flowering stems linear, acuminate, the lower ones elongated; inflorescence a very narrow panicle; pedicels rather stout, ascending, 3–5 mm. long; calyx-lobes lanceolate, acute; corolla pale-yellow, its segments narrowly oblong, acute, united at base into a very short tube; stamens much shorter than the corolla.

TYPE LOCALITY: Coyote Creek, Santa Clara County, California.
DISTRIBUTION: Central California.

14. **Dudleya grandiflora** Rose, Bull. N. Y. Bot. Gard. 3 : 16. 1903.

Caudex very thick, crowned by a dense rosette. Basal leaves strap-shaped, slightly broadened at insertion and gradually tapering from the base to apex, rather thin, 1–1.5 dm. long, 1–2 cm. broad just above the base, very glaucous on both sides, especially when very young; flowering stalk 3–5 dm. long, bright-red especially above, bearing scattered ovate acuminate leaves; inflorescence rather compact, consisting of a few upright secund racemes; pedicels, especially the lower ones, elongated, 1–1.5 cm. long; calyx usually red, deeply 5-lobed, the lobes ovate, acute, about half the length of the corolla; corolla greenish-yellow, becoming reddish in age, 10 mm. long, erect except the spreading acute tips, its

segments united at the base into a very short tube 2 mm. long; stamens shorter than the corolla, attached to its base; carpels erect, distinct.

TYPE LOCALITY: Whitewater, near Banning, California.
DISTRIBUTION: Known only from the type locality.

15. **Dudleya linearis** (Greene) Britton & Rose, Bull. N. Y. Bot. Gard. **3**: 16. 1903.

Cotyledon linearis Greene, Pittonia **1**: 285. 1889.

Caudex thick and fleshy, crowned by a dense rosette of leaves. Leaves light-green, not farinose, broadly linear, acuminate, 3–7.5 cm. long, 6–9 mm. broad, thick; flowering stems 1–1.5 cm. long, more or less bracteate; inflorescence consisting of 2 or 3 secund racemes, more or less glaucous, rather compact; pedicels 4 mm. long or less; calyx deeply 5-lobed; lobes broadly lanceolate, acute, 5 mm. long; corolla greenish-yellow, 8–9 mm. long, its tube shorter than the calyx.

TYPE LOCALITY: San Benito Island, off the coast of Lower California.
DISTRIBUTION: Known only from the type locality.

16. **Dudleya cultrata** Rose, Bull. N. Y. Bot. Gard. **3**: 16. 1903.

Cespitose, the caudex bearing several rosettes of leaves. Leaves strap-shaped, not glaucous, 6–10 cm. long, gradually tapering from a rather wide base, 10–12 mm. broad, rather thickish, terete near the apex, acute, sometimes sharply so; flowering branch about 30 cm. long, naked below and with scattered leaves above; inflorescence of a few more or less elongated racemes; calyx-lobes triangular-lanceolate, acute; corolla pale-yellow, rather narrow, 12 mm. long, 3 times as long as the calyx, the tube proper longer than the calyx, the segments acute; stamens shorter than the corolla; anthers orange.

TYPE LOCALITY: San Quintin, Lower California.
DISTRIBUTION: Type locality and vicinity.

17. **Dudleya Greenei** Rose, Bull. N. Y. Bot. Gard. **3**: 17. 1903.

Caudex short and thick. Leaves in rosettes, numerous, strap-shaped, 6–7 cm. long, 15 mm. broad at base, acute, very glaucous, drying thick and leathery; flowering stalk 3–4 dm. high, bearing scattered ovate-acuminate leaves; inflorescence consisting of numerous secund racemes; pedicels stout, ascending, 2–4 mm. long; calyx 4 mm. high, deeply 5-parted, the lobes broadly lanceolate, acute; corolla 8–10 mm. long, its tube 2 mm. long.

TYPE LOCALITY: Island of Santa Cruz, California.
DISTRIBUTION: Island of Santa Cruz.

18. **Dudleya Hallii** Rose, Bull. N. Y. Bot. Gard. **3**: 17. 1903.

Acaulescent. Basal leaves erect or spreading, elongated-lanceolate, acute, very pale and glaucous, thickish, 10–12 cm. long; flowering stems stout, 3–4 dm. long, their leaves ovate, the lower ones somewhat elongated, slightly cordate at base; inflorescence a rather short panicle, not at all glaucous; pedicels very short (about 2 mm. long); calyx-lobes lanceolate, acute, 5 mm. long; corolla 15 mm. long, pale-green tinged with rose.

TYPE LOCALITY: Near Riverside, California.
DISTRIBUTION: Type locality and vicinity.

19. **Dudleya Candelabrum** Rose, Bull. N. Y. Bot. Gard. **3**: 17. 1903.

Basal leaves in a dense broad rosette, oblong-lanceolate, 10–15 cm. long, 3 cm. broad near the base, perhaps not at all glaucous, drying rather thin; flowering stem about 3 dm. long, rather stout, its leaves lanceolate, acuminate, thin; inflorescence (in herbarium specimens at least) resembling a candelabrum, 20 cm. high, 25 cm. broad at top, each branch an elongated secund raceme; pedicels short (1–4 mm. long); calyx 5–7 mm. long, deeply parted into lanceolate acuminate lobes; corolla 5–9 mm. long.

TYPE LOCALITY: Island of Santa Cruz, California.
DISTRIBUTION: Island of Santa Cruz.

20. **Dudleya Bryceae** Britton, Bull. N. Y. Bot. Gard. 3: 17. 1903.

Caudex stout, short. Basal leaves very numerous, lanceolate to oblong-lanceolate, 6–8 cm. long, 2–3 cm. wide, flat, about 2 mm. thick, pale-green, somewhat shining, sharply acuminate; flowering stems ascending from the lower axils, about 3 dm. long, their leaves lanceolate, acuminate; cyme many-flowered, about 8 cm. broad; pedicels 3–6 mm. long; calyx-segments linear-lanceolate, 4 mm. long, about 1 mm. wide towards the base, gradually tapering to an acute tip, the tube very short; corolla pale-yellow, 1 cm. long, 5-ridged, its linear-lanceolate lobes about as long as its tube; carpels erect, distinct to the base.

TYPE LOCALITY: Uncertain; described from living plant in collections of New York Botanical Garden sent from San Diego, California; probably from Lower California.

21. **Dudleya ingens** Rose, Bull. N. Y. Bot. Gard. 3: 18. 1903.

Caudex 3 dm. high or more, densely clothed with the bases of old leaves and crowned by a rosette of large leaves 10–20 cm. long, and 3–4 cm. broad. Flowering stem 5–6 dm. long; inflorescence a somewhat open panicle; calyx-lobes narrowly lanceolate, half as long as the corolla, somewhat glaucous.

TYPE LOCALITY: San Telmo, Lower California.
DISTRIBUTION: Known only from the type locality.

22. **Dudleya candida** Britton, Bull. N. Y. Bot. Gard. 3: 18. 1903.

Caudex stout, about 6 cm. high. Basal leaves white-farinose all over, numerous, linear to linear-oblong, sharply acuminate, somewhat widened at the base, 5–7 cm. long, 1 cm. wide or less; flowering branch stout, about 3 dm. tall, its narrowly lanceolate leaves somewhat clasping; inflorescence dense, about 6 cm. broad; pedicels stout, 2–5 mm. long; calyx-segments linear-lanceolate, acute to acuminate, more than one-half as long as the linear acute corolla-segments.

TYPE LOCALITY: Coronados Island, California.
DISTRIBUTION: Known only from the type locality.

23. **Dudleya rigidiflora** Rose, Bull. N. Y. Bot. Gard. 3: 18. 1903.

Basal leaves not seen; flowering stem stout, 3–4 dm. long, purplish. Inflorescence of numerous long slender secund racemes; pedicels ascending, 4–5 mm. long; calyx deeply 5-cleft, its lobes equal, fleshy, 6–7 mm. long, acuminate, somewhat glaucous; corolla reddish, 12 mm. long, the tube 5 mm. long, the lobes slender, acute and erect; stamens 10, much shorter than the corolla, all attached near the top of the corolla-tube; carpels 5, slender, erect, free to the base.

TYPE LOCALITY: Plaza Maria, Lower California.
DISTRIBUTION: Known only from the type locality.

24. **Dudleya laxa** (Lindl.) Britton & Rose, Bull. N. Y. Bot. Gard. 3: 18. 1903.

Echeveria laxa Lindl. Jour. Hort. Soc. London 4: 292. 1849.
Cotyledon laxa Benth. & Hook.; S. Wats. Bot. Calif. 1: 212. 1876.

Rootstock very short, erect. Flowering stems 6 dm. high or less, rather slender; leaves glaucous, or becoming yellowish-green, ovate to lanceolate, acute to acuminate, 4–7 cm. long, or the upper ones shorter and relatively broader; cyme loose, its branches slender, often forked, the flowers secund; pedicels 1 cm. long or less; calyx-segments ovate to ovate-lanceolate, acute, 3–4 mm. long; corolla yellow, deeply lobed, 1–1.5 cm. long, its lobes oblong-lanceolate, acute to acuminate.

TYPE LOCALITY: Monterey, California.
DISTRIBUTION: Southern and central California.

25. **Dudleya bernardina** Britton, Bull. N. Y. Bot. Gard. 3: 19. 1903.

Acaulescent, green, or the young leaves and inflorescence somewhat glaucous. Basal leaves forming a rosette, spreading, obovate-spatulate to rhombic-obovate, abruptly sharp-acuminate, 5–8 cm. long, 5 cm. wide or less; flowering branch 1.5–2.5 dm. high, leafy to

or nearly to the base, its leaves lanceolate to ovate-lanceolate, acute or acuminate, sagittate-clasping; cyme 10 cm. broad or less, many-flowered; pedicels becoming 1–1.5 cm. long; calyx 5–6 mm. long, deeply 5-lobed, the lobes ovate, acute; corolla yellow, about 12 mm. long, cleft to below the middle, its lobes sharply acute; stamens about three-fourths as long as the corolla.

TYPE LOCALITY: San Bernardino Mountains, southern California.
DISTRIBUTION: Mountains of southern California.

26. **Dudleya Goldmani** Rose, Bull. N. Y. Bot. Gard. 3: 19. 1903.

Acaulescent. Basal leaves in small dense rosettes, rhomboid-ovate, acuminate, 2–4 cm. long, green or often bronzed, more or less glaucous; flowering branches rather delicate, about 10 cm. long, their leaves small, ovate, cordate at base, acute; inflorescence few-flowered, the flat-topped cyme very glaucous; pedicels 10–15 mm. long, slender; calyx 4–5 mm. long, its lobes ovate, acutish; corolla pinkish or deep orange, 10 mm. long, its tube very short, its lobes oblong, acutish, rather thin and perhaps more inclined to spread than in other species; stamens and styles considerably shorter than the corolla.

TYPE LOCALITY: Pine Valley, head of Carmel River, Monterey County, California.
DISTRIBUTION: Mountains of central California.

27. **Dudleya minor** Rose, Bull. N. Y. Bot. Gard. 3: 19. 1903.

Acaulescent, or very old plants with a carrot-shaped rootstock 5 cm. long, crowned by a small rosette of spreading leaves. Leaves rhomboid-ovate, the larger ones 5–7 cm. long, narrowed at base, abruptly acuminate, glaucous; inflorescence slender, with a few elongated one-sided racemes; pedicels slender, 10–15 mm. long; calyx 5–7 mm. long, its lobes ovate to ovate-lanceolate, acute; corolla yellow or pale-orange, 12 mm. long, its tube 2 mm. long.

TYPE LOCALITY: San Gabriel Cañon, altitude 600 to 700 meters, Los Angeles County, California.
DISTRIBUTION: Type locality and vicinity.

28. **Dudleya ovatifolia** Britton, Bull. N. Y. Bot. Gard. 3: 20. 1903.

Glabrous, green, 1.5 dm. high or less. Flowering stems rigid; basal leaves ovate, shining above, acute, about 2 cm. long; leaves of the flowering stems ovate, or the lower ovate-lanceolate, obtuse, or the lower acute, 5–8 mm. long; cymes few-flowered; pedicels very slender, 1 cm. long or less; flowers about 1 cm. long; calyx-segments triangular-ovate-lanceolate, about 2.5 mm. long, nearly as long as the corolla-tube; corolla bright-yellow, its segments lanceolate, acute.

TYPE LOCALITY: Sierra Santa Monica, California.
DISTRIBUTION: Known only from the type locality.

29. **Dudleya nevadensis** (S. Wats.) Britton & Rose, Bull. N. Y. Bot. Gard. 3: 20. 1903.

Cotyledon nevadensis S. Wats. Bot. Calif. 1: 212. 1876.

Acaulescent, green, scarcely glaucous. Basal leaves obovate to oblanceolate-spatulate, acute or acuminate, 6–10 cm. long, 3–5 cm. wide, narrowest at the base; leaves of flowering branches lanceolate to oblong-lanceolate, 1–3 cm. long, acute, sessile or slightly clasping; flowering branches 1–2 dm. high; cyme compound, rather dense, 5–8 cm. broad; pedicels rather stout, 6–12 mm. long, mostly longer than the flowers; flower-buds short-ovoid, acute, little longer than thick; calyx-segments triangular-ovate-lanceolate, acute, 3–4 mm. long, glaucous; corolla 10–12 mm. long, yellow tinged with red, cleft to the middle or below.

TYPE LOCALITY: Sonora, California.
DISTRIBUTION: Mountains of middle California.

30. **Dudleya Plattiana** (Jepson) Britton & Rose, Bull. N. Y. Bot. Gard. 3: 20. 1903.

Cotyledon Plattiana Jepson, Fl. West. Middle Calif. 267. 1901.

Acaulescent. Leaves somewhat glaucous, oblanceolate, 7–10 cm. long, narrowed at base, acute or acuminate; flowering stems 12–20 cm. long; stem-leaves lanceolate, rather

narrow at base; inflorescence rather short, more or less flat-topped; pedicels slender, 4–10 mm. long; calyx-lobes triangular, acute or acuminate; corolla-segments lanceolate, acute, 8–10 mm. long, reddish or drying so.

TYPE LOCALITY: Vaca Mountains, California.
DISTRIBUTION: Inner coast range, central California.

31. **Dudleya Purpusi** (Schum.) Britton & Rose, Bull. N. Y. Bot. Gard. 3: 20. 1903.

Echeveria Purpusi Schum. Gartenflora 45: 608. 1896.
Cotyledon Purpusi Nichols. Dict. Gard. Suppl. 263. 1900.

Pale-green, somewhat glaucous; tufted. Basal leaves 4–7 cm. long, 2 cm. wide or less, rhombic, broadest near the middle, sharply acuminate; flowering branches 1–2 dm. tall, their leaves lanceolate, acute, 2 cm. long or less, sessile, numerous; cyme 4–8 cm. broad; pedicels rather stout, longer than the flowers; flower-buds ovoid, acuminate, longer than thick; calyx-segments ovate, acutish, about 5 mm. long, one-third as long as the lemon-yellow corolla; corolla-segments narrowly lanceolate, acuminate, separate nearly to the base.

TYPE LOCALITY: California.
DISTRIBUTION: Mountains of middle California.
ILLUSTRATIONS: Schumann, *loc. cit. f. 97;* Gard. Chron. 20: *f. 123;* Bot. Mag. *pl. 7713.*

32. **Dudleya Sheldoni** Rose, Bull. N. Y. Bot. Gard. 3: 20. 1903.

Acaulescent. Leaves lanceolate to ovate-lanceolate, acute, very glaucous, 4–5 cm. long, somewhat thickish at base but drying thin and papery; flowering stems rather slender, 16–20 cm. high, purplish, leafy to the base; lower stem-leaves linear-lanceolate, 4 cm. long, the upper ones ovate, acute; inflorescence a rather compact panicle; pedicels rather slender, sometimes 10 mm. long; calyx-lobes reddish, ovate, acute; corolla yellow, 10–11 mm. long, the lobes sharply acute, spreading at tip, free nearly to base; stamens attached just above the base of the corolla, about two-thirds as long as the lobes; carpels 5, erect.

TYPE LOCALITY: North base of Mt. Tamalpais, California.
DISTRIBUTION: Type locality and vicinity.

33. **Dudleya robusta** Britton, Bull. N. Y. Bot. Gard. 3: 21. 1903.

Acaulescent. Basal leaves numerous, ascending, lanceolate, acuminate, light-green, sometimes slightly glaucous, 10–15 cm. long, 1.5–2.5 cm. wide; flowering branches stout, leafy to or nearly to the base, 4–5 dm. high, erect-ascending, their leaves lanceolate to ovate-lanceolate, sagittate, the upper ones very small, the lower 4–6 cm. long; cyme many-flowered, about 10 cm. broad; pedicels, or some of them, at length 1–1.5 cm. long, white-glaucous; calyx 5–6 mm. long, deeply cleft, its lobes ovate, sharply acute, white-glaucous; corolla about 1.3 cm. long, orange, cleft to below the middle, the lobes acute.

TYPE LOCALITY: Southern California.
DISTRIBUTION: Southern California.

34. **Dudleya Parishii** Rose, Bull. N. Y. Bot. Gard. 3: 21. 1903.

Acaulescent. Basal leaves in a rosette, lanceolate, acuminate, not very thick for this genus, not at all glaucous, becoming red; flowering stems rather stout, reddish, 3–4 dm. high; lower leaves narrowly lanceolate, upper ones smaller, ovate, only slightly clasping at base; inflorescence paniculate, somewhat flat-topped, the branches spreading; pedicels rather slender, 4–8 mm. long; calyx-lobes broadly ovate, acute (in herbarium specimens sharply acute); corolla about 10 mm. long, rather pale orange, drying quite reddish.

TYPE LOCALITY: Near San Bernardino, California.
DISTRIBUTION: Southern California and Arizona.

35. **Dudleya cymosa** (Lemaire) Britton & Rose, Bull. N. Y. Bot. Gard. 3: 21. 1903.

Echeveria cymosa Lemaire, Rev. Hortic. 1858: 439. 1858.
Cotyledon cymosa Baker, in Saund. Ref. Bot. 1: *pl. 68.* 1869.

Acaulescent, at least so in all specimens seen. Leaves forming a very dense rosette, rather thin for the genus, oblong-lanceolate, 10–12 cm. long, broadest about one-third the

way up, and here 2.5–3 cm. wide and thence tapering to a very sharp tip, old ones bronzed, young ones very pale and densely pulverulent; flowering branches erect or spreading; stem-leaves slender, 3–4 cm. long, rounded at base, acute; pedicels slender, 5–12 mm. long; calyx-lobes ovate, acute; corolla pale-yellow, rather slender, 12 mm. long, its segments rather thin, spreading at tip, distinct nearly to the base; stamens about two-thirds the length of the corolla, attached at its very base.

TYPE LOCALITY: California.
DISTRIBUTION: Central California.
ILLUSTRATION: Baker, *loc. cit.*

36. **Dudleya Brandegei** Rose, Bull. N. Y. Bot. Gard. **3**: 21. 1903.

Acaulescent. Leaves in a dense rosette, rigid, ovate-oblong, long-acuminate, the larger ones 1 dm. long, pale and slightly glaucous; flowering stems 4–6 dm. long, rather stout, reddish; inflorescence of several elongated one-sided racemes; pedicels rather stout, 1–1.5 cm. long; calyx deeply cleft into ovate-lanceolate lobes, these acute and 6–7 mm. long; corolla 10–14 mm. long, yellowish, the segments nearly erect, a little longer than the tube; stamens shorter than the corolla, attached near the top of its tube; carpels erect, free to the base.

TYPE LOCALITY: Lower California.
DISTRIBUTION: Lower California.

37. **Dudleya lurida** Rose, Bull. N. Y. Bot. Gard. **3**: 22. 1903.

Acaulescent. Basal leaves ascending or nearly erect, very numerous, not at all glaucous at flowering time, at last deeply bronzed, lanceolate-acuminate, 10–15 cm. long, 10–22 mm. broad at the middle, fleshy but not very thick for this genus; flowering stems stout, purplish, 4–5 dm. tall, their leaves broadly ovate, acute, clasping, 0.7–2 cm. long; inflorescence paniculate, the branches elongated; pedicels 8–12 mm. long, rather slender; calyx-lobes ovate, acute, 5–6 mm. long, reddish; corolla reddish, 12–15 mm. long, the segments erect, acute.

TYPE LOCALITY: Santa Monica Mountains, Los Angeles County, California.
DISTRIBUTION: Southern California.

38. **Dudleya pauciflora** Rose, Bull. N. Y. Bot. Gard. **3**: 22. 1903.

Leaves forming dense rosettes, linear, slightly broadened at base, long-acuminate, 2–3 cm. long, 1 cm. broad at base, reddish, perhaps somewhat glaucous; flowering stems 5–10 cm. long, few-leaved; inflorescence a cyme of 6–8 flowers, the longer pedicels 8–10 mm. long; calyx 5-lobed, its lobes ovate, acute, 1.5–2 mm. long; corolla-tube shorter than the calyx, its segments 5–6 mm. long, lanceolate, acute, probably reddish.

TYPE LOCALITY: San Pedro Martir Mountain, northern Lower California.
DISTRIBUTION: Known only from the type locality.

39. **Dudleya nubigena** (Brand.) Britton & Rose, Bull. N. Y. Bot. Gard. **3**: 22. 1903.

Cotyledon nubigena Brand. Proc. Calif. Acad. II. **3**: 136. 1891.

Glaucous; basal leaves numerous, broadly spatulate to oblong-lanceolate, abruptly acute, thick, 6–8 cm. long. Flowering stems 4–5 dm. high, divided at top into 2 or 3 one-sided racemes, their leaves ovate, acute, cordate-clasping, 1 cm. long; pedicels 1–1.5 cm. long, slender, ascending; calyx-lobes deltoid, acute, equaling or longer than the corolla-tube; corolla reddish, less than 1 cm. long, its segments separate to below the middle.

TYPE LOCALITY: Summits of the Sierra de Laguna, southern Lower California.
DISTRIBUTION: Southern Lower California.

40. **Dudleya Xanti** Rose, Bull. N. Y. Bot. Gard. **3**: 23. 1903.

Resembling *D. nubigena* but of smaller stature. Basal leaves in a small but rather dense rosette, broadly ovate, 4–5 cm. long, more or less glaucous; flowering stems 2–3 dm. long, slender, usually 2-branched, forming long slender racemes; pedicels slender, 8–12 mm. long; calyx small, deeply lobed, the lobes broadly ovate, obtuse or even rounded at apex,

2–3 mm. long; corolla 8–10 mm. long, reddish, its tube usually if not always longer than the calyx; stamens much shorter than the corolla; carpels erect.

TYPE LOCALITY: San Lucas, Lower California.
DISTRIBUTION: Southern Lower California.

41. **Dudleya rubens** (Brand.) Britton & Rose, Bull. N. Y. Bot. Gard. 3: 23. 1903.

Cotyledon rubens Brand. Proc. Calif. Acad. II. 2: 155. 1889.

Acaulescent; slightly pulverulent. Leaves 5–7.5 cm. long, 12 mm. broad, lanceolate, acute; flowering branches 1–1.5 dm. high, bearing a few auriculate-clasping leaves; inflorescence a few-branched panicle or reduced to a single secund raceme; pedicels 6 mm. long or less; calyx-lobes broadly ovate, acute; corolla dull-red with segments more than half the length of the tube.

TYPE LOCALITY: Cliffs near San Esteban in the interior of central Lower California, about 27° 50′ latitude.
DISTRIBUTION: Lower California.

42. **Dudleya gigantea** Rose, Bull. N. Y. Gard. 3: 23. 1903.

Acaulescent or nearly so, with a thick short rootstock. Basal leaves in a dense rosette, very glaucous, oblanceolate, 5–7 cm. long, drying very thin; flowering stems rather stout, about 3 cm. long; inflorescence paniculate, with numerous usually erect branches; pedicels rather slender, 5–10 mm. long, erect; calyx-lobes broadly ovate, obtuse or acutish; corolla drying deep-red, 9–10 mm. long, the segments erect, acute, united at base into a short tube 1.5 mm. long.

TYPE LOCALITY: New York Falls, Amador County, California.
DISTRIBUTION: Known only from the type locality.

43. **Dudleya rigida** Rose, Bull. N. Y. Bot. Gard. 3: 23. 1903.

Basal leaves numerous, borne on a thick woody caudex, flat but fleshy, oblong, 5–7 cm. long, acuminate, somewhat glaucous; flowering branches long, slender and weak; inflorescence of a few (usually 2) secund racemes; pedicels slender, the lower ones longer, sometimes 10–15 mm. long; calyx-lobes ovate, longer than the tube, acute; corolla 12 mm. long, reddish, with erect segments.

TYPE LOCALITY: Lower California.
DISTRIBUTION: Known only from the type locality.
ILLUSTRATION: Baker, in Saund. Ref. Bot. 1: *pl. 66*, as *Cotyledon pulverulentum*.

44. **Dudleya lanceolata** (Nutt.) Britton & Rose, Bull. N. Y. Bot. Gard. 3: 23. 1903.

Echeveria lanceolata Nutt.; T. & G. Fl. N. Am. 1: 561. 1840.
Cotyledon lanceolata Benth. & Hook.; S. Wats. Bot. Calif. 1: 211. 1876.

Acaulescent; green or slightly glaucous. Basal leaves numerous, lanceolate, long-acuminate, the outer 10–15 cm. long, 1.5–2 cm. wide; scapes stout, 4–6 dm. tall, their leaves lanceolate from a broad cordate or sagittate base, acuminate, the uppermost 1 cm. long or less; cyme 10 cm. broad or less; pedicels stout, 3–8 mm. long; calyx-segments broadly ovate, acute or obtusish, about 4 mm. long; corolla reddish-yellow, 12–16 mm. long.

TYPE LOCALITY: San Diego, California.
DISTRIBUTION: Southern California.
ILLUSTRATION: Torrey, Bot. Mex. Bound. Surv. *pl. 24*.

45. **Dudleya delicata** Rose, Bull. N. Y. Bot. Gard. 3: 24. 1903.

Leaves in dense rosettes, in clusters of 4–6 or more, erect or somewhat spreading rather narrow, broadest at the base, the outer ones 2 cm. broad, the inner ones considerably smaller and narrower, gradually tapering to an acute apex, 6–8 cm. long, fleshy but flattened, very glaucous; flowering stems slender, about 20 cm. long, the leaves ovate, acute; pedicels very short, 2–4 mm. long; calyx-lobes equal, ovate, acute, not glaucous; corolla rather

narrow, greenish-yellow, the lobes slightly spreading at tip, obtuse or barely acutish, oblong, united at base into a short tube barely 2 mm. long.

TYPE LOCALITY: Spencer Valley, near Julian, San Diego County, California.
DISTRIBUTION: Southern California.

46. **Dudleya Palmeri** (S. Wats.) Britton & Rose, Bull. N. Y. Bot. Gard. **3**: 24. 1903.

Cotyledon Palmeri S. Wats. Proc. Am. Acad. **14**: 292. 1879.

Caulescent. Leaves narrowly triangular, 5 cm. long, 16–18 mm. broad at base, short-acuminate, reddish, not mealy nor glaucous; flowering stems about 1 dm. long; inflorescence a few spreading secund racemes, somewhat glaucous; pedicels 6–12 mm. long; calyx-lobes triangular-ovate, 4 mm. long; corolla pale lemon-yellow, 10–12 mm. long.

TYPE LOCALITY: San Simeon Bay, San Luis Obispo County, California.
DISTRIBUTION: Known only from the type locality.

47. **Dudleya Brauntoni** Rose, Bull. N. Y. Bot. Gard. **3**: 24. 1903.

Plants cespitose, the rootstock crowned by 6–8 rosettes of leaves. Leaves elongated, strap-shaped, becoming 20 cm. long and 2 cm. broad, but often at flowering time only 10 cm. long and 1 cm. broad, pale-green and very glaucous on the face, acute; flowering stem usually stout, 3–6 dm. long, pale-green, their lower leaves often quite large, the upper ones ovate, acute, thickish, slightly cordate at base; inflorescence at first somewhat compact, of 3 or 4 branches, these finally much elongated (10–20 cm. long); pedicels very short (not elongated in fruit), 1–3 mm. long; calyx-lobes broadly ovate, 4–5 mm. long, acute; segments of corolla pale greenish-yellow, 10–12 mm. long, erect.

TYPE LOCALITY: Elysian Hills, Los Angeles, California.
DISTRIBUTION: Known only from the type locality.

48. **Dudleya brevipes** Rose, Bull. N. Y. Bot. Gard. **3**: 24. 1903.

Cespitose, the rootstock crowned by a cluster of 5 or 6 rosettes of leaves. Leaves lanceolate to strap-shaped, 8–10 cm. long, 10–18 mm. broad, acute to shortly acuminate, not glaucous, somewhat shining; flowering branches about 30 cm. long, naked only near the base, their leaves ovate, acute, slightly cordate at base, spreading or ascending; inflorescence of several spreading branches; pedicels very short (3–4 mm. long); calyx deeply 5-parted, the lobes acute, glaucous; corolla-segments reddish-yellow, acute.

TYPE LOCALITY: Calmalli, Lower California.
DISTRIBUTION: Known only from the type locality.

49. **Dudleya compacta** Rose, Bull. N. Y. Bot. Gard. **3**: 25. 1903.

Rootstock crowned by a cluster of closely set rosettes of leaves. Basal leaves oblong-lanceolate, rigid, very fleshy, bright shining-green, sometimes 6 cm. long but usually less, 2 cm. wide or less, broadest at base, gradually narrowed toward the ovate acute tip; flowering stem 2–3 dm. long, reddish, not at all glaucous, its lower leaves ovate-oblong, the upper ones short, broadly ovate, cordate, acutish, very thick; inflorescence rather compact, of several branches bearing a few flowers; pedicels short, the lower ones 3–4 mm. long; calyx-lobes acutish, in herbarium specimens decidedly acute; corolla pale straw-colored, 8–10 mm. long, the segments acutish, spreading at tip.

TYPE LOCALITY: Rocks about San Francisco Bay.
DISTRIBUTION: Coast of central California.

50. **Dudleya congesta** Britton, Bull. N. Y. Bot. Gard. **3**: 25. 1903.

Acaulescent, green throughout, not at all glaucous. Basal leaves rhombic-lanceolate to rhombic-ovate, sharply acuminate, dull, 5 cm. long or less, 1.5–2 cm. wide; flowering branch stout, about 13 cm. tall, erect, its cordate-sagittate leaves numerous, triangular, acute to acuminate, the lower 1 cm. long, the upper much smaller; cyme compound, dense, about 6 cm. broad; pedicels very stout and short, 3 mm. long or less, erect; calyx as long as or a little shorter than the pedicels, its lobes ovate, sharply acute, longer than its tube,

slightly longer than wide; corolla lemon-yellow, about three times as long as the calyx, its lanceolate segments acute, separate to below the tips of the calyx-lobes.

TYPE LOCALITY: Southern California.
DISTRIBUTION: Known only from the type locality.

51. **Dudleya Eastwoodiae** Rose, Bull. N. Y. Bot. Gard. **3**: 25. 1903.

Caudex short, crowned by a dense rosette of leaves. Leaves rather short-ovate, broadest at base, acute, 2–4 cm. long, green or becoming bronzed, not glaucous or only slightly so, thickish; flowering stalks rather stout, 15–25 cm. high, densely bracted, their leaves ovate, somewhat clasping; inflorescence a rather compact cyme, the branches short, densely flowered; pedicels stout and short, 2–5 mm. long; calyx small, 3–4 mm. long, cleft to below the middle, the lobes ovate and obtuse; corolla-segments yellow (not turning reddish in age), 10–12 mm. long, oblong, obtuse, the tube very short; stamens much shorter than the corolla, equally inserted near its base.

TYPE LOCALITY: Bodega Point, Sonora County, California.
DISTRIBUTION: Known only from the type locality.

52. **Dudleya acuminata** Rose, Bull. N. Y. Bot. Gard. **3**: 26. 1903.

Cespitose, the 5 or 6 dense rosettes crowning a thick caudex. Leaves not very numerous (12–20), erect or ascending, broadly ovate, acuminate, 4–7 cm. long, broadest at base (2–2.5 cm. broad), thickish, pale green but not glaucous; flowering stems 25–30 cm. high, naked below, their leaves 1–1.5 cm. long, ovate, acute, sagittate at base; inflorescence slightly glaucous; pedicels short, 3–6 mm. long; calyx 5 mm. long, deeply 5-cleft, the lobes triangular-ovate, acute (rather sharply so in dried specimens); corolla reddish-yellow.

TYPE LOCALITY: Near Calmalli, 50 miles east of Lagoon Head, Lower California.
DISTRIBUTION: Lower California. Cedros Island.

53. **Dudleya Lingula** (S. Wats.) Britton & Rose, Bull N. Y. Bot. Gard. **3**: 26. 1903.

Cotyledon Lingula S. Wats. Proc. Am. Acad. **14**: 293. 1879.

Shortly caulescent, terminated by a dense rosette of leaves. Leaves oblong, acute, 5–7.5 cm. long by 2.5 cm. broad; flowering stem 4–6 dm. long, slender and weak; inflorescence somewhat paniculate, consisting of 3–6 slender erect branches; pedicels 2 mm. long or less; calyx-lobes ovate, acute; corolla 1 cm. long.

TYPE LOCALITY: San Simeon Bay, California.
DISTRIBUTION: Only known from the type locality.

54. **Dudleya septentrionalis** Rose, Bull. N. Y. Bot. Gard. **3**: 26. 1903.

Caudex crowned by several crowded rosettes of leaves covered throughout with a white powder. Leaves compact in the rosettes, rather short, thickish, acute, ovate, broadest at base, 2–2.5 cm. broad; flowering stems stout, rather weak and short for the genus, 6–8 cm. long, purplish, naked below, but thickly set with small leaves above, these broadly ovate, acute; inflorescence a very compact cyme; calyx deeply cleft, glaucous, the lobes broadly ovate, acute; corolla pale greenish-yellow, rather short and broad, the broad obtuse lobes thickish on the back and united at base into a very short tube.

TYPE LOCALITY: Crescent City, Del Norte County, California.
DISTRIBUTION: Coast of northern California.

55. **Dudleya paniculata** (Jepson) Britton & Rose, Bull. N. Y. Bot. Gard. **3**: 27. 1903.

Cotyledon caespitosa paniculata Jepson, Fl. West. Middle Calif. 267. 1901.

Acaulescent. Leaves in a dense rosette, ovate-oblong, about 10 cm. long, at least the inner ones quite glaucous; inflorescence an elongated panicle, 20–30 cm. long; pedicels 4–10 mm. long; calyx-lobes ovate-triangular, acute; corolla pale-yellow.

TYPE LOCALITY: Morrison Cañon near Niles, California.
DISTRIBUTION: Known only from the type locality.

56. **Dudleya humilis** Rose, Bull. N. Y. Bot. Gard. 3: 27. 1903.

Cespitose, clinging to the rocks, sometimes a dozen or more rosettes of leaves crowning the rootstock. Leaves linear-ovate, somewhat narrowed below, acute or shortly acuminate, 3–4 cm. long, 10–15 mm. broad, very glaucous; flowering branches 2–4 cm. long, their lower leaves lanceolate, somewhat clasping; inflorescence a short panicle, few to very many-flowered; pedicels short, 2–5 mm. long; calyx-lobes ovate, acute; corolla at first pale-yellow but drying reddish, 7–8 mm. long, its segments acute, somewhat spreading at tip, about twice as long as the calyx.

TYPE LOCALITY: Mount Diablo, California.
DISTRIBUTION: Known only from the type locality.

57. **Dudleya caespitosa** (Haw.) Britton & Rose, Bull. N. Y. Bot. Gard. 3: 27. 1903.

Cotyledon caespitosa Haw. Misc. Nat. 180. 1803.
Cotyledon linguiformis R. Br. in Ait. Hort. Kew. ed. 3. 2: 109. 1811.
Cotyledon reflexa Willd. Enum. Hort. Berol. Suppl. 24. 1813.
Echeveria caespitosa DC. Prodr. 3: 401. 1828.

Acaulescent, green or somewhat glaucous. Basal leaves ovate to ovate-oblong or oblong-lanceolate, the outer 2.5–7 cm. long, 1.5–2 cm. wide; scapes rather slender, 3 dm. high or less, their leaves triangular-ovate, acute, small; cyme more or less compound, dense, 8 cm. wide or less; pedicels stout, shorter than the flowers, 2–5 mm. long; corolla yellow, 12–15 mm. long; calyx-segments ovate, acute; carpels about 6 mm. long.

TYPE LOCALITY: California. Erroneously cited in original description as from Cape of Good Hope.

DISTRIBUTION: Central and northern California.
ILLUSTRATION: DC. Hort. Genev. *pl. 14*.

58. **Dudleya Helleri** Rose, Bull. N. Y. Bot. Gard. 3: 27. 1903.

Caudex crowned by several (8 in specimens seen) small dense rosettes of leaves. Basal leaves linear to ovate-linear, 3–4 cm. long, very glaucous, thickish, acute, 15 mm. wide at the base, 10 mm. wide or less just above the base; flowering branches slender, 10–15 cm. long, bright-red, usually naked below (at least for 2–6 cm.), their leaves ovate, the upper ones short and acute; inflorescence a rather small flat-topped cyme of 2–5 branches, each branch bearing 3–6 flowers; pedicels short, 2–5 mm. long; calyx-lobes ovate, acute; corolla deep-yellow, less than 10 mm. long, the lobes united at base into a very short tube, broadly ovate, acute; stamens a little shorter than the corolla-lobes, attached almost at the base of the corolla.

TYPE LOCALITY: Monterey County, California.
DISTRIBUTION: Type locality and vicinity.

59. **Dudleya Cotyledon** (Jacq.) Britton & Rose, Bull. N. Y. Bot. Gard. 3: 28. 1903.

Sedum Cotyledon Jacq. f. Eclog. 1: 27. 1811.
Cotyledon californica Baker, in Saund. Ref. Bot. 1: *pl. 70*. 1869.
Echeveria californica Baker, *loc. cit.* as syn. 1869.

Acaulescent, or very nearly so, tinged with red. Basal leaves numerous, linear-lingulate, pale-green, slightly glaucous, 6–10 cm. long, 2 cm. wide or less, sharply acuminate, the base widened; flowering branches stout, 4–5 dm. long, erect-ascending, glaucous, their leaves numerous, ovate to triangular-ovate, sagittate, half-clasping, acute, the lower ones about 2 cm. long, the upper gradually smaller, the similar bracts of the inflorescence 5 mm. long or less; inflorescence cymose-paniculate, 2.5 dm. long or less; pedicels stout, 4–10 mm. long; calyx white-farinose, its lobes triangular-ovate, acute, 3 mm. long; corolla yellow, 1 cm. long, its tube slightly shorter than the calyx, its oblong-lanceolate segments acute, slightly keeled.

TYPE LOCALITY: Monterey, California.
DISTRIBUTION: Known only from the type locality and vicinity.
ILLUSTRATIONS: Jacq. *loc. cit. pl. 17;* Baker, *loc. cit.*

60. **Dudleya elongata** Rose, Bull. N. Y. Bot. Gard. 3: 28. 1903.

Stems elongated, at length 2–4 dm. long, simple or branched; leaves nearly linear, broadest near the base, very glaucous, 4–8 cm. long, 9 mm. wide or less, acute to acuminate; flowering stems leafless below, leafy above, the leaves ovate, acute, cordate, 1 cm. long or less; inflorescence cymose-paniculate; pedicels very short, 1–2 mm. long; calyx-lobes ovate, acute, 4 mm. long, twice as long as the tube; corolla 12 mm. long, at first reddish-yellow, in age deep-red.

TYPE LOCALITY: Near San Pedro, California.
DISTRIBUTION: Known only from the type locality.

16. **GORMANIA** Britton, Bull. N. Y. Bot. Gard. 3: 29. 1903.

Low, *Sedum*-like species, perennial by horizontal rootstocks. Leaves spatulate to obovate or nearly orbicular, those of the flowering stems similar to the basal ones, but smaller. Flowers cymose or thyrsoid, yellow to red. Calyx mostly deeply 5-lobed, the lobes acute or obtuse. Petals 5, united below the middle, acute to acuminate, somewhat spreading above. Stamens 10, borne on the corolla; anthers mostly oblong. Carpels many-seeded, united below, erect or nearly so, even in fruit.

Type species, *Cotyledon oregonensis* S. Wats.

Corolla yellow to cream-colored tinged with rose.
  Corolla bright-yellow to pale-yellow.
    Corolla-segments acute to acuminate, little longer than the filaments.
      Leaves spatulate to obovate-cuneate.
        Corolla-segments united one-third of their length or more. — 1. *G. Watsoni.*
        Corolla-segments united about one-fourth of their length or less.
          Calyx-lobes ovate. — 2. *G. obtusata.*
          Calyx-lobes oblong-lanceolate. — 3. *G. Hallii.*
      Leaves orbicular; flowering stems diffuse. — 4. *G. debilis.*
    Corolla-segments long-acuminate, much longer than the filaments. — 5. *G. oregana.*
  Corolla cream-colored tinged with rose; calyx-lobes ovate. — 6. *G. Burnhami.*
Corolla pink or red.
  Calyx-lobes lanceolate, acuminate; branches of the inflorescence long, slender. — 7. *G. laxa*
  Calyx-lobes ovate, acute; branches of the compact inflorescence short.
    Leaves relatively thin, retuse to obcordate. — 8. *G. retusa.*
    Leaves thick, rounded at the apex. — 9. *G. Eastwoodiae.*

1. **Gormania Watsoni** Britton, Bull. N. Y. Bot. Gard. 3: 29. 1903.

Cotyledon oregonensis S. Wats. Proc. Am. Acad. 17: 373. 1882. Not *Sedum oreganum* Nutt.

Rootstock stout, horizontal. Basal leaves spatulate, 1.5–3 cm. long, 7–9 mm. wide, obtuse or emarginate; leaves of the stem similar but narrower, 1.5 cm. long or less; cymose inflorescence elongated, sometimes 1.5 dm. long, compact, the lower peduncles from the upper axils; pedicels 2–5 mm. long; calyx-segments triangular-ovate to ovate, 2.5–3 mm. long, acute; petals pale-yellow, lanceolate, acute or acuminate, united for about one-third their length; corolla about 1 cm. long, slightly exceeding the stamens; follicles erect, subulate-tipped.

TYPE LOCALITY: Cascade Mountains, northern Oregon.
DISTRIBUTION: Oregon.

2. **Gormania obtusata** (A. Gray) Britton, Bull. N. Y. Bot. Gard. 3: 29. 1903.

Sedum obtusatum A. Gray, Proc. Am. Acad. 7: 342. 1868.

Green or slightly glaucous; rootstock rather stout. Flowering stems 7–15 cm. tall 3 leaves spatulate, obtuse, the larger about 2 cm. long; cyme somewhat elongated, often longer than broad, its branches rather slender; pedicels 3–6 mm. long; calyx-segments ovate, obtuse or obtusish, about 2 mm. long; corolla-segments oblong-lanceolate to ovate-lanceolate, yellow, united for one-fourth their length or less, acute, 5–6 mm. long, a little longer than the stamens and styles.

TYPE LOCALITY: Granite rocks in the Sierra Nevada, California, on Mount Hoffman and above Sonora Pass.
DISTRIBUTION: Sierra Nevada of California.

3. **Gormania Hallii** Britton, Bull. N. Y. Bot. Gard. 3: 29. 1903.

Spreading, matted, green, not glaucous, the flowering stems 8 cm. high or less. Leaves spatulate to spatulate-obovate, 15 mm. long or less, 4–6 mm. wide, rounded or slightly retuse at the apex, a little concave on the upper surface, the upper ones similar, narrower; calyx about 3 mm. long, its segments oblong-lanceolate, obtusish; corolla bright-yellow, about 7 mm. long, its tube somewhat shorter than the calyx, its lobes oblong-lanceolate, obtusish; pedicels very slender, 2–8 mm. long; cyme little compound, thyrsoid, about ; cm. broad, 3–5 cm. high.

TYPE LOCALITY: Vicinity of Tuolumne meadows, Yosemite National Park, California.
DISTRIBUTION: Central California.

4. **Gormania debilis** (S. Wats.) Britton, Bull. N. Y. Bot. Gard. 3: 30. 1903.

Sedum debile S. Wats. Bot. King's Exp. 102. 1871.

Perennial by slender branched rootstocks, glabrous; stems slender, weak, decumbent, or erect, simple or branched, 3–12 cm. high. Leaves obovate-orbicular, or the upper ones oblong, obtuse, sessile, 2–8 mm. wide; cymes 2–5 cm. broad; flowers pedicelled, the pedicels often as long as the calyx or longer; calyx-segments ovate-lanceolate, acutish; petals yellow, lanceolate, acuminate, about twice as long as the calyx, 6–8 mm. long, united at the very base; follicles erect, tipped by the subulate styles.

TYPE LOCALITY: On rocky ridges on the East and West Humboldt mountains Nevada and in the Wahsatch and Uintas.
DISTRIBUTION: Utah, Nevada, Idaho and eastern Oregon.

5. **Gormania oregana** (Nutt.) Britton, Bull. N. Y. Bot. Gard. 3: 30. 1903.

Sedum oreganum Nutt.; T. & G. Fl. N. Am. 1: 559. 1840.

Glabrous, green; rootstock slender, creeping; flowering stems slender, erect or ascending, 8–15 cm. high. Leaves spatulate-cuneate, obtuse or rounded at the apex, the lower 1.7 cm. long or less, the upper much smaller; cyme compound, 2–8 cm. broad; pedicels very short, mostly shorter than the calyx; calyx-segments lanceolate to ovate-lanceolate, acute or acuminate; corolla 8–11 mm. long, bright-yellow fading pink in age, its linear-lanceolate long-acuminate segments united for about one-fifth their length, much exceeding the stamens.

TYPE LOCALITY: Rocks near the mouth of the Oregon River.
DISTRIBUTION: Alaska to northern California.

6. **Gormania Burnhami** Britton, Bull. N. Y. Bot. Gard. 3: 30. 1903.

Rootstocks horizontal, rather slender. Basal leaves spatulate to obovate-cuneate, thick, somewhat glaucous, retuse or obcordate, 1–2 cm. long, 1 cm. wide or less, those of the flowering stems similar, smaller; flowering stems 15 cm. high or less, rather stout. reddish; inflorescence thyrsoid, 6–10 cm. long, about 5 cm. wide, rather loose; pedicels stout, 3–6 mm. long, mostly shorter than the linear bracts; calyx 4–6 mm. long, its ovate or ovate-lanceolate lobes acute or acuminate; corolla cream-colored, tinged with rose, about 1 cm. long, its lobes oblong-lanceolate, acute, united for about one-fourth their length.

TYPE LOCALITY: Between Lake Eleanor and Lake Vernon, Tuolumne County, California.
DISTRIBUTION: California.

7. **Gormania laxa** Britton, Bull. N. Y. Bot. Gard. 3: 29. 1903.

Glabrous, green, about 3 dm. tall; flowering stems erect. Leaves spatulate, about 2 cm. long, obtuse; inflorescence loose, cymose-paniculate, about 10 cm. broad and 16 cm. long, its branches lax, slender; pedicels 2–3 mm. long; calyx-segments ovate-lanceolate, acute, 4–5 mm. long; corolla red or pink, 10–11 mm. long, its lobes lanceolate, acute, united nearly to the middle; anthers about 2 mm. long; carpels erect, united at the base.

TYPE LOCALITY: Waldo, Oregon.
DISTRIBUTION: Oregon.

2. **Altamiranoa (?) Jurgensenii** (Hemsl.) Rose.

Cotyledon Jurgensenii Hemsl. Diag. Pl. Nov. 1 : 9. 1878.

Suffruticose, erect, hispidulous, branching. Leaves small (3–4 mm. long), ovate-oblong, obtuse, hispidulous; inflorescence a 2- or 3-flowered cyme; sepals hispidulous, distinct, linear-lanceolate, obtuse; corolla reddish, twice as long as the calyx, its lobes lanceolate, apiculate, united at base.

TYPE LOCALITY: Mexico.
DISTRIBUTION: Known only from type specimen.

3. **Altamiranoa elongata** Rose, Bull. N. Y. Bot. Gard. **3**: 31. 1903.

Perennial, at first with slender erect branches, but rather weak and becoming prostrate, striking root at every joint, finely puberulent. Leaves small, closely set at right angles to the branches, appearing imbricate in dried specimens, linear-ovate, acute, puberulent, 6 mm. long, turgid but somewhat flattened, with a cordate somewhat clasping base; inflorescence paniculate, its ultimate branches secund, bearing a few sessile flowers; sepals linear, 2 mm. long, puberulent; corolla white or pinkish, 5 mm. long, campanulate, its segments united at base into a short tube; carpels distinct.

TYPE LOCALITY: Mountains above Pachuca, Mexico.
DISTRIBUTION: Type locality and vicinity.

4. **Altamiranoa calcicola** (Robinson & Greenman) Rose, Bull. N. Y. Bot. Gard. **3**: 32. 1903.

Sedum calcicola Robinson & Greenman, Am. Jour. Sci. III. **50**: 150. 1895.

Perennial, described as procumbent but probably only so at base, 2–3 dm. high, much branched, green or sometimes quite glaucous, the older branches somewhat roughened. Leaves numerous, very turgid and nearly terete (in all specimens seen), 10–16 mm. long, obtusish; inflorescence of 2 or 3 secund racemes, 3–5 cm. long, many-flowered; pedicels very short or wanting; sepals ovate to oblong, obtuse, somewhat unequal, 1–2.5 mm. long; corolla-segments greenish-yellow, united at base, lanceolate-attenuate, 5 mm. long; scales short and broad; carpels united at base.

TYPE LOCALITY: Las Cuevas, San Luis Potosi, Mexico.
DISTRIBUTION: San Luis Potosi.

5. **Altamiranoa parva** (Hemsl.) Rose, Bull. N. Y. Bot. Gard. **3**: 32. 1903.

Sedum parvum Hemsl. Diag. Pl. Nov. 3: 51. 1880.

Perennial, herbaceous, cespitose, much branched. Leaves oblong, spreading, 3–6 mm. long; sepals short, obtuse; corolla-segments yellow, lanceolate, acute, united at base; scale minute.

TYPE LOCALITY: Near the city of San Luis Potosi, Mexico.
DISTRIBUTION: Known only from the type locality.

6. **Altamiranoa Goldmani** Rose, Bull. N. Y. Bot. Gard. **3**: 32. 1903.

A low much branched *Sedum*-like plant, glabrous throughout, with tuberous-thickened roots. Old stems somewhat woody, procumbent and rooting at the joints, bearing scattered rosettes of leaves; flowering branches more elongated, 5–6 cm. long, rose-colored, bearing many rather closely set leaves; leaves very narrow, linear or nearly so, 10–12 mm. long, flattened, obtuse; inflorescence a very compact few-flowered cyme; flowers sessile; sepals distinct, linear, fleshy but flattened, obtuse, appressed to the corolla, unequal, 4–6 mm. long, reddish-tinged; corolla 6 mm. long, not at all 5-angled, very thin when dry, pale-yellow, tinged with red, orange-colored when dry, its tube a little longer than the lobes; lobes ovate, acute, spreading; stamens 10, all borne at the top of the corolla-tube; scales small, purplish, 0.3 mm. long, about as broad as high, retuse at apex; carpels 5, distinct, oblong, reddish near tip, many-seeded; styles short.

TYPE LOCALITY: Summit of Cerro de Patamban, Michoacan, Mexico.
DISTRIBUTION: Known only from the type locality.

7. **Altamiranoa Batesii** (Hemsl.) Rose, Bull. N. Y. Bot. Gard. **3**: 32. 1903.

Cotyledon Batesii Hemsl. Diag. Pl. Nov. 1: 9. 1878.

Perennial, suffrutescent at base, with rather short (1–1.5 dm. long), spreading, reddish branches. Leaves on short sterile branches in dense rosettes, on flowering branches linear, terete, or nearly so, 1 cm. long, acute, tuberculately roughened, in age curved backward and sometimes even reflexed; inflorescence a leafy, few-branched, flat-topped cyme; flowers sessile; sepals distinct, linear, turgid, green, very unequal, 2–4 mm. long; corolla 4 mm. high, the lobes widely spreading, ovate, white except a green or purplish stripe on back but drying purplish, the tube about 1 mm. long; stamens all borne on the corolla, about half as long as the lobes; scales small, purple.

TYPE LOCALITY: Mexico.
DISTRIBUTION: Central Mexico.
ILLUSTRATION: Biol. Centr. Am. Bot. *pl. 19*.

8. **Altamiranoa Galeottiana** (Hemsl.) Rose.

Cotyledon Galeottiana Hemsl. Diag. Pl. Nov. 1: 9. 1878.

Herbaceous, branching, glabrous. Leaves 12–18 mm. long; fleshy, glabrous, spatulate, petiolate; flowers white, pedicellate; corolla-segments united to about the middle.

TYPE LOCALITY: Mountains of Oaxaca, Mexico.
DISTRIBUTION: Known only from the type locality.

9. **Altamiranoa mexicana** (Schlecht.) Rose.

Umbilicus mexicanus Schlecht. Linnaea **13**: 409. 1839.
Cotyledon mexicana Hemsl. Biol. Centr. Am. Bot. **1**: 390. 1880.

Perennial; stems woody, erect, glabrous. Leaves linear in outline, glabrous, 4–8 mm. long, obtuse; inflorescence cymose; sepals filiform, shorter than the corolla; corolla white, campanulate, its lobes acuminate, united at base into a short tube.

TYPE LOCALITY: Mineral del Monte, Hidalgo, Mexico.
DISTRIBUTION: Known only from the type locality.

10. **Altamiranoa scopulina** Rose, Bull. N. Y. Bot. Gard. **3**: 32. 1903.

Glabrous throughout. Stems more or less creeping and much branched, the lower parts covered with whitish scales (bases of old dead leaves); leaves linear, nearly terete, 4–6 mm. long, sessile and with a free projection down the stem, closely set but scarcely imbricate; flowers few, near the tops of the branches, sessile or short-pedicelled; sepals leaf-like, shorter than the petals, somewhat unequal; corolla-segments pure white, oblong, acute, 5 mm. long, slightly united at base, nearly flat; appendages minute; stamens shorter than the corolla.

TYPE LOCALITY: Rocky hills near Tepeaca, south of Puebla, Mexico.
DISTRIBUTION: Known only from the type locality.

11. **Altamiranoa fusca** (Hemsl.) Rose, Bull. N. Y. Bot. Gard. **3**: 33. 1903.

Sedum fuscum Hemsl. Biol. Centr. Am. Bot. **1**: 395. 1880.

Described as an annual but perhaps a biennial or possibly a perennial, diffusely branching, 1 dm. high or less. Leaves broadly oblong, fleshy, 4–6 cm. long, obtuse; inflorescence cymose; pedicels 2 mm. long or less; sepals distinct, free at base; corolla-segments white, united for one-fourth their length.

TYPE LOCALITY: San Luis Potosi, Mexico.
DISTRIBUTION: Type locality and vicinity.

12. **Altamiranoa chihuahuensis** (S. Wats.) Rose, Bull. N. Y. Bot. Gard. **3**: 33. 1903.

Sedum chihuahuense S. Wats. Proc. Am. Acad. **23**: 273. 1888.

Described as annual but producing small tubers, simple below, branching above, 7–15 cm. tall. Leaves sessile, oblong or oblong-lanceolate, obtuse, 2–3 mm. long; corolla-segments white, united at base, oblanceolate, 4 mm. long; carpels divergent above.

TYPE LOCALITY: Rocky ledges, Sierra Madre of Chihuahua, Mexico.
DISTRIBUTION: Known only from the type locality.

18. **STYLOPHYLLUM** Britton & Rose, Bull. N. Y. Bot. Gard. 3: 33. 1903.

Perennials with more or less branched rootstocks; basal leaves linear, elongated, terete, or flattened but always narrow, sometimes abruptly widened below into a broad clasping base; flowering stems with long sessile leaves not clasping at base. Calyx 5-lobed, the lobes ovate, equal and small. Corolla campanulate, not angled, white, red or yellowish, its lobes broad, thin and spreading, united below into a tube. Stamens 10, borne on the corolla-tube. Carpels 5, united below, generally strongly spreading as in *Sedum*.

Type species, *Cotyledon edulis* Nutt.

Leaves distinctly flattened, especially in the lower half.
- Leaves viscid. — 1. *S. viscidum.*
- Leaves not viscid.
  - Leaves green. — 2. *S. virens.*
  - Leaves glaucous.
    - Calyx-lobes obtuse. — 3. *S. albidum.*
    - Calyx-lobes acute.
      - Corolla bright yellow or sometimes tinged with red.
        - Inflorescence flat-topped; calyx-lobes broadly-ovate. — 4. *S. Traskæ.*
        - Inflorescence elongated; calyx-lobes oblong-ovate. — 5. *S. semileres.*
      - Corolla not yellow but somewhat reddish.
        - Leaves rather broad for genus, acute. — 6. *S. insulare.*
        - Leaves narrower than the last, obtuse. — 7. *S. Hassei.*

Leaves terete or nearly so except just at base.
- Calyx-lobes acute..
  - Leaves broad at base; rootstock thick. — 8. *S. edule.*
  - Leaves not broad at base; rootstock slender. — 9. *S. attenuatum.*
- Calyx-lobes not acute.
  - Calyx-lobes rounded at apex; flowers white or yellowish. — 10. *S. Parishii.*
  - Calyx-lobes obtuse.
    - Inflorescence compact. — 11. *S. densiflorum.*
    - Inflorescence open. — 12. *S. Orcuttii.*

1. **Stylophyllum viscidum** (S. Wats.) Britton & Rose, Bull. N. Y. Bot. Gard. 3: 33. 1903.

Cotyledon viscida S. Wats. Proc. Am. Acad. 17: 372, 1882.

Caudex very short. Basal leaves numerous, narrowly lanceolate, acuminate, viscid, obtusely triquetrous, the outer 7–9 cm. long, about 1 cm. wide. Scapes 3 dm. tall or taller, slender to rather stout, their leaves similar to the basal ones but smaller, the uppermost about 1 cm. long; cyme compound, many-flowered, 8 cm. broad or less; small slender-peduncled cymes are also sometimes borne in the axils of the scape-leaves; pedicels 1–4 mm. long; calyx-segments ovate-lanceolate, acute, purplish, 3–4 mm. long; corolla reddish, 8–10 mm. long, cleft to below the middle; stamens and styles about as long as the corolla.

TYPE LOCALITY: Rocks near the Hot Springs, San Juan Capistrano, Los Angeles County, California.
DISTRIBUTION: Southern California.
ILLUSTRATION: Hook. Ic. *pl. 1554.*

2. **Stylophyllum virens** Rose, Bull. N. Y. Bot. Gard. 3: 34. 1903.

The thick and elongated branched stem sprawling over rocks, the lower parts clothed with old leaves, the ends crowned by dense rosettes of bright green leaves. Leaves spreading or often reflexed, shining, not glaucous, 5–9 cm. long, gradually tapering from the base and there 10–15 mm. broad, fleshy but flattened throughout; inflorescence a weak many-branched panicle; calyx-lobes ovate, somewhat acutish in living specimens; corolla reddish, campanulate; carpels spreading.

TYPE LOCALITY: San Clemente Island, California.
DISTRIBUTION: Known only from San Clemente Island.

3. **Stylophyllum albidum** Rose, Bull. N. Y. Bot. Gard. 3: 34. 1903.

Basal leaves in a dense rosette, strap-shaped, widest at base, gradually tapering at the apex, very glaucous, 4 cm. long, 1 cm. broad at base, very thick, the upper one third terete. Flowering stems reddish, 2–3 dm. long, their leaves narrow, somewhat acuminate; inflor-

escence a somewhat flattened cyme; pedicels very stout and short, 2–4 mm. long; calyx-lobes ovate, obtuse, very short, 2 mm. long; corolla 7 mm. long, reddish, its lobes lanceolate, acute, its tube 2 mm. long; stamens all borne at the top of tube, shorter than the corolla; carpels somewhat spreading above and united at base.

TYPE LOCALITY: San Clemente Island, California.
DISTRIBUTION: Known only from San Clemente Island.

4. **Stylophyllum Traskae** Rose, Bull. N. Y. Bot. Gard. 3: 34. 1903.

Caudex thick and woody. Leaves forming a dense rosette, strap-shaped, 4–5 cm. long, 8–10 mm. broad, glabrous, acute; flowering branches about 20 cm. long, reddish, with rather small scattered leaves; inflorescence a rather compact flat-topped cyme; pedicels short, 2–4 mm. long; calyx-lobes broadly ovate, acute or obtusish; corolla bright canary-yellow, 8 mm. long, the lobes somewhat spreading; carpels inclined to spread.

TYPE LOCALITY: Santa Barbara Island, southern California.
DISTRIBUTION: Known only from Santa Barbara Island.

5. **Stylophyllum semiteres** Rose, Bull. N. Y. Bot. Gard. 3: 35. 1903.

At first acaulescent but old plants decidedly caulescent and branching. Leaves numerous, closely set on the caudex, linear, semiterete, about 10 cm. long, often becoming reddish, acute; flowering branches about 20 cm. long, their leaves ovate, turgid, acute, the lowest ones often opposite; inflorescence a pair of secund racemes; pedicels very short (1–3 mm. long); calyx 5 mm. long, its lobes 4 mm. long, ovate, acute; corolla 9 mm. long, its segments united below for about 2 mm., oblong, obtuse, yellowish but tinged with red; stamens borne on the corolla, all shorter than the corolla but those alternating with the lobes shorter than the others; carpels somewhat spreading.

TYPE LOCALITY: Lower California or the Colorado Desert of California.
DISTRIBUTION: Known only from the type locality.

6. **Stylophyllum insulare** Rose, Bull. N. Y. Bot. Gard. 3: 34. 1903.

Stems very thick and woody, 6–8 cm. in diameter, crowned by a rosette of spreading leaves, the old leaves somewhat persistent. Leaves 11–15 cm. long, 1–1.5 cm. broad above the base, 2 cm. broad at base, fleshy, much flattened except toward the apex, acute, more or less glaucous especially when young; flowering branch stout, purplish, 3–4 dm. long; inflorescence paniculately branched; primary branches short, nearly equal, two or three times dichotomous, the ultimate branches short and few-flowered; calyx 3 mm. long, its lobes twice as long as the tube, ovate, acute; corolla 7 mm. long, reddish, somewhat campanulate, its tube about the length of the carpels; carpels united at base, widely spreading.

TYPE LOCALITY: Santa Catalina Island, California.
DISTRIBUTION: Known only from Santa Catalina Island.

7. **Stylophyllum Hassei** Rose, Bull. N. Y. Bot. Gar. 3: 35. 1903.

Caudex elongated, sometimes about 3 dm. long, 2–3 cm. in diameter, somewhat branching, covered with the old persistent leaves, crowned with a dense erect rosette. Leaves very glaucous, linear, not tapering except toward the apex, 10 cm. long or less, 1 cm. wide or less, thick but flattened below, terete and obtuse toward apex; flowering stems weak, their primary branches 1–2-dichotomous, the ultimate branches slender and many-flowered; calyx small, glaucous, 4 mm. long, cleft to or below the middle, its lobes ovate, acute; corolla-tube about 1 mm. long; carpels widely spreading in age.

TYPE LOCALITY: Sea beach of Santa Catalina Island, California.
DISTRIBUTION: Known only from Santa Catalina Island.

8. **Stylophyllum edule** (Nutt.) Britton & Rose, Bull. N. Y. Bot. Gard. 3: 36. 1903.

Sedum edule Nutt. in T. & G. Fl. N. Am. 1: 560. 1840.
Cotyledon edulis Brewer, Bot. Calif. 1: 211. 1876.

Stem a short thick caudex covered with numerous turgid leaves, these nearly terete except at base where somewhat flattened. Flowering stem glabrous, 3–5 dm. high, the

lower part bearing linear leaves; inflorescence an open panicle; flowers subsessile; calyx 5-parted; calyx-lobes equal, ovate, acute, 3–4 mm. long; corolla yellowish, its segments united at base, 6–7 mm. long, widely spreading, acute and keeled at apex; stamens 10, all borne on the corolla, those alternating with the corolla-lobes attached lower down than the others and broadened at base; carpels united at base, in age widely spreading.

TYPE LOCALITY: Edges of rocks and ravines, San Diego, California.
DISTRIBUTION: Southern California near the sea.

9. **Stylophyllum attenuatum** (S. Wats.) Britton & Rose, Bull. N. Y. Bot. Gard. 3: 36. 1903.

Cotyledon attenuata S. Wats. Proc. Am. Acad. 22: 472. 1887.

Caulescent and woody at base, branching above. Basal leaves linear, terete, about 1 dm. long; flowering stems several from the crown of leaves, leafy below; inflorescence a pair of terminal secund racemes and several short lateral ones; flowers short-pedicelled or subsessile; calyx-lobes ovate, acutish, 3 mm. long; corolla 8 mm. long, yellowish, tinged with green below, reddish above, its lobes united at base for one-fourth their length; carpels united at base, only slightly spreading, but clearly separated from each other above.

TYPE LOCALITY: San Quintin, Lower California.
DISTRIBUTION: Known only from the original station.

10. **Stylophyllum Parishii** Britton, Bull. N. Y. Bot. Gard. 3: 37. 1903.

Stems not as thick as in *S. edule*, somewhat glaucous. Flowering branches 2–3 dm. high, rather weak, glabrous; inflorescence paniculate; pedicels 8 mm. long or less; calyx 5-parted, the lobes 4 mm. long, broadly oblong with rounded apex; corolla-segments twice as long as the calyx, united at the base into a tube 2 mm long, yellowish (?); stamens 10, borne on the corolla at the top of the tube; carpels united only near the base.

TYPE LOCALITY: Pala, San Diego County, Cal.
DISTRIBUTION: Known only from the type locality.

11. **Stylophyllum densiflorum** Rose, Bull. N. Y. Bot. Gard. 3: 36. 1903.

Cotyledon nudicaule Abrams, Bull. So. Calif. Acad. Sci. 2: 42. 1903. Not *C. nudicaulis* Lam. 1786.

Plants growing in dense clumps with more or less branching rootstocks, very glaucous throughout. Leaves numerous, erect, nearly terete, acute, 6–12 cm. long; flowering branches slender and weak; inflorescence a rather dense compact cyme, its ultimate branches rather short, 4–8-flowered; pedicels short, 1–3 mm. long; calyx 2 mm. long, its lobes twice as long as the tube, broadly ovate to orbicular, obtuse; corolla white or pinkish, 6 mm. long, its segments spreading, distinct nearly to the base; stamens 10, a little shorter than the corolla; carpels spreading.

TYPE LOCALITY: San Gabriel Cañon, Los Angeles County, California.
DISTRIBUTION: Type locality and vicinity.

12. **Stylophyllum Orcuttii** Rose, Bull. N. Y. Bot. Gard. 3: 36. 1903.

Resembling *S. attenuatum* in its foliage and habit, but stouter and very glaucous. Corolla-tube much shorter and shorter even than the calyx, the lobes broader and more keeled, rose-colored, not at all tinged with yellow; calyx-lobes obtusish; anthers red.

TYPE LOCALITY: Initial Monument, California.
DISTRIBUTION: Southern California and adjacent islands.

19. **HASSEANTHUS** Rose, Bull. N. Y. Bot. Gard. 3: 37. 1903.

Stems several, arising from small globose or oblong corms. Basal leaves linear, terete, narrowed below into flattened petioles; stem-leaves narrowly ovate, turgid but somewhat flattened. Calyx 5-lobed. Corolla-segments united at base into a short tube, yellow, or white changing to purple. Carpels 5, united at base (?), widely spreading.

Type species, *Sedum variegatum* S. Wats.

13. Ubi bibi bibi bene ego mea bona Davidem
Cumulo Sanctos

Flowers white to purplish ; infloresence somewhat mealy or glaucous. 1. *H. Blochmanae.*
Flowers bright-yellow ; plant not at all glaucous or mealy.
  Corolla-tube about the length of the calyx ; petals pure yellow. 2. *H. elongatus.*
  Corolla-tube much shorter than the calyx : petals streaked with purple.
    Petals 4 mm. long ; leaves 4 mm. long. 3. *H. variegatus.*
    Petals 7–8 mm. long ; leaves 2–3 cm. long. 4. *H. multicaulis.*

1. **Hasseanthus Blochmanae** (Eastw.) Rose, Bull. N. Y. Bot. Gard. 3 : 37. 1903.

Sedum Blochmanae Eastw. Proc. Calif. Acad. Sci. II. 6 : 422. 1896.

Corms shallow, nearly globular or somewhat fusiform, 15 mm. long. Stems several, ascending, 1–1.5 cm. high ; basal leaves not seen ; stem-leaves narrowly ovate-lanceolate, somewhat clasping ; inflorescence cymose ; pedicels very short ; calyx 5 mm. long, the lobes somewhat unequal, ovate, acute ; corolla at first white but becoming rose-colored.

TYPE LOCALITY : Along the road to Point Sal, near Casmailia Beach, Santa Barbara County, California.
DISTRIBUTION : Known only from the type locality.
ILLUSTRATION : Eastwood, *loc. cit. pl. 53.*

2. **Hasseanthus elongatus** Rose, Bull. N. Y. Bot. Gard. 3 : 37. 1903.

Corms oblong in outline ; stem long and slender. Lower stem-leaves slender, 2–3 cm. long ; inflorescence of few branches, sometimes only 2 and much elongated ; flowers short-pedicelled ; calyx-lobes oblong, acute ; corolla bright-yellow sometimes tinged with red, its lobes widely spreading ; carpels widely spreading.

TYPE LOCALITY : San Joaquin Hills, Orange County, California.
DISTRIBUTION : Southern California.

3. **Hasseanthus variegatus** (S. Wats.) Rose, Bull. N. Y. Bot. Gard. 3 : 37. 1903.

Sedum variegatum S. Wats. Proc. Am. Acad. 11 : 137. 1876.

Perennial by a small shallow corm ; stems several, 5–7 cm. high, variegated, smooth. Basal leaves not known ; stem-leaves purplish, ovate-oblong, probably turgid, 4 mm. long ; inflorescence usually of 1 or 2 secund few-flowered racemes ; flowers short-pedicelled or subsessile ; calyx 3 mm. long, 5-lobed, the lobes ovate, acute ; corolla-lobes united into a short tube, broadly lanceolate, 4 mm. long, yellow veined with purple ; stamens and styles a little shorter than the corolla-lobes ; carpels united at base, when mature widely spreading.

TYPE LOCALITY : San Diego, California.
DISTRIBUTION : Very local, San Diego County, California.

4. **Hasseanthus multicaulis** Rose, Bull. N. Y. Bot. Gard. 3 : 38. 1903.

Perennial by an oblong corm 2–3 cm. long. Stems 2–5, rather stout, 1–2.5 dm. high, variegated, glabrous, not at all glaucous ; basal leaves 3–4 cm. long, terete, acute ; stem-leaves 1–2.5 cm. long, ovate-oblong, acute or acuminate, turgid or somewhat flattened ; inflorescence of several secund, many-flowered racemes ; flowers subsessile ; calyx-lobes ovate, obtuse ; flower-buds pinkish, obtuse ; corolla-segments widely spreading above the middle, pale-yellow tinged with red, 7–8 mm. long, slightly united at base ; stamens 10, borne on base of corolla-segments ; carpels widely spreading (?) in age.

TYPE LOCALITY : Clay bluffs near Santa Monica, Los Angeles County, California.
DISTRIBUTION : Known only from the type locality.

20. **DIAMORPHA** Nutt. Gen. 1 : 293. 1818.

Low annual or biennial herbs, with branched stems, and perfect pink or purple flowers in corymbose cymes, the leaves alternate, nearly terete. Calyx-segments 4 or 5, very small. Petals 4 or 5, distinct to the base, much longer than the calyx. Stamens 8 or 10, with filiform filaments and nearly black anthers. Carpels 4 or 5, united below the middle. Follicle-tips spreading.

Type species, *Tillaea cymosa* Nutt.

Petals oblong, about three times as long as wide. 1. *D. cymosa.*
Petals ovate-oblong, about twice as long as wide. 2. *D. Smallii.*

1. **Diamorpha cymosa** (Nutt.) Britton ; Small, Fl. SE. U. S. 498. 1903.

Tillaea? cymosa Nutt. Gen. 1 : 110. 1818.
Diamorpha pusilla Nutt. Gen. 1 : 293. 1818. Not *Sedum pusillum* Michx.

Glabrous, reddish, 2–10 cm. high, branching near or at the base, the branches very slender. Leaves 2–5 mm. long, 2–3 mm. wide, oblong, obtuse, sessile ; cymes few–several-flowered, the pedicles slender, 1–2.5 mm. long ; calyx-segments triangular, acute or acutish, slightly spreading ; petals oblong, boat-shaped, 3 mm. long, obtuse, about three times as long as wide ; stamens shorter than the petals ; carpels lanceolate ; follicles lanceolate, 2–2.5 mm. long, widely spreading above the united lower part, their tips curved.

TYPE LOCALITY : Flatrock, near Camden, South Carolina.
DISTRIBUTION : On rocks, North Carolina and Tennessee to Georgia and Alabama.
ILLUSTRATION : DC. Mem. Crass. *pl. 1, f. 9.*

2. **Diamorpha Smallii** Britton, sp. nov.

Very delicate and almost filiform, glabrous, 5 cm. high or less. Leaves oblong, obtuse, 1.5–2 mm. long ; cymes few-flowered, the pedicels filiform, about 2 mm. long ; calyx-segments triangular, acute ; petals broadly ovate-oblong, obtuse, 2–2.5 mm. long, about twice as long as wide ; carpels ovoid.

Falls of the Yadkin River, Stanley County, North Carolina, J. K. Small, April 20–24, 1896.

21. **CREMNOPHILA** Rose, gen. nov.

Perennial with a thick woody caudex and *Pachyphytum*-like leaves forming dense rosettes ; leaves large, very thick, glabrous. Inflorescence a narrow compact panicle, the lower branches scarcely longer than the others. Calyx deeply 5-lobed, the lobes erect, narrow, thickish. Corolla bright-yellow ; petals distinct. Stamens 10, free to the base. Scales retuse. Carpels erect.

Type species, *Sedum nutans* Rose.

1. **Cremnophila nutans** Rose.

Sedum nutans Rose, Bull. N. Y. Bot. Gard. **3** : 43. 1903.

Caudex 5–7 cm. long, 10–12 mm. in diameter. Leaves 6–8 cm. long, 3–4 cm. broad, 1 cm. or more thick, green, not glaucous ; flowering stem 1–2 dm. long, bearing many orbicular to ovate obtuse leaves 1–2 cm. long ; panicle about 1 dm. long, many-flowered ; calyx-lobes 4–6 mm. long ; petals bright-yellow, 6 mm. long, acute.

This is a most interesting plant and quite unlike any other known Mexican species of the Crassulaceae. The plants grow on damp mossy nearly perpendicular cliffs and in almost inaccessible places. The flowering stem usually hangs down and the secondary branches stand up, but in herbarium specimens the reverse is suggested ; in cultivated specimens the flowering stems are nearly erect.

TYPE LOCALITY : Mossy cliffs of Tepoxtlan, Morelos, Mexico, altitude 2250 meters.
DISTRIBUTION : Known only from the type locality.

22. **RHODIOLA** L. Sp. Pl. 1035. 1753.

Perennials with a woody and somewhat branching rootstock. Leaves broad and comparatively thin. Flowers dioecious or polygamous, 4- or 5-parted. Corolla purplish, yellowish or greenish. Carpels erect. Style very short or none.

Type species, *Rhodiola rosea* L.

Petals yellow or greenish-yellow, obtuse.
  Petals flat ; leaves ovate to oblanceolate. 1. *R. rosea.*
  Petals concave, hooded at the apex ; leaves, except the lower, linear to narrowly oblanceolate. 2. *R. neo-mexicana.*
Petals purple or purplish, acuminate to obtuse.
  Follicles 3–8 mm. long ; western species.
    Petals obtuse ; Alaskan species. 3. *R. alaskana.*
    Petals acute to acuminate ; western species.
      Petals acute ; follicles 3–5 mm. long, the beak 0.5 mm. long, divergent or recurved. 4. *R. integrifolia.*
      Petals abruptly acuminate ; follicles 6–8 mm. long, the beak 1 mm. long, ascending or spreading. 5. *R. polygama.*
  Follicles 8–12 mm. long ; southeastern species. 6. *R. roanensis.*

Dawson Harbor, Queen Charlotte Islands
Aurtick Columbia

Dear N. Lascuvieta Auttigu meet
Queen Charlotte Island

1. **Rhodiola rosea** L. Sp. Pl. 1035. 1753.

Sedum roseum Scop. Fl. Carn. ed. 2. 1 : 326. 1772.
Sedum Rhodiola DC. Pl. Grasses *pl. 143*. 1805.

Perennial by a rose-scented woody root, glabrous and somewhat glaucous, 1–4 dm. high. Leaves sessile, oval, oblanceolate or obovate, dentate or entire, 1–5 cm. long, the lower ones smaller; cyme dense, 1–5 cm. broad; flowers yellowish-green, mostly dioecious, 5–8 mm. broad; sepals oblong, narrower and shorter than the blunt, flat, linear-oblong petals; follicles 2–6, 8–10 mm. long, their short, bluntish tips spreading.

TYPE LOCALITY: Mountains of Lapland, Austria, Switzerland and England.
DISTRIBUTION: Newfoundland and Greenland to Alaska, south to Maine; two isolated stations in eastern Pennsylvania. Also in Europe.
ILLUSTRATIONS: DC. Pl. Grasses *pl. 143*; Fl. Deutsch. ed. 6. *pl. 2637*; Engl. Bot. *pl. 508*; Benth. Handb. Br. Fl. *f. 358*; Britt. & Brown, Ill. Fl. *f. 1810*.

2. **Rhodiola neo-mexicana** Britton, Bull. N. Y. Bot. Gard. 3 : 38. 1903.

Stems stout, very leafy, 1–2.5 dm. high. Leaves linear-oblong, narrowed at both ends, entire, acute or obtusish, 2–3 cm. long, 3–7 mm. wide, or the lower proportionately shorter and broader and some of them serrulate; cymes terminal, dense, the staminate ones 2–3 cm. broad, the pistillate ones smaller; pedicels shorter than the petals or equaling them; petals linear-lanceolate, cucullate at the apex, longer than the linear calyx-segments; filaments one-half longer than the petals.

TYPE LOCALITY: White Mountain Peak, Lincoln County, New Mexico, at 3,500 m.
DISTRIBUTION: Known only from the type locality.

3. **Rhodiola alaskana** Rose, Bull. N. Y. Bot. Gard. 3 : 39. 1903.

Resembling *R. integrifolia* but usually taller and more slender, often 20 cm. high, usually quite pale and appearing glaucous in herbarium specimens. Leaves oblanceolate, acute, 2–2.5 cm. long, strongly toothed in the upper third, drying very thin; petals purplish, obtuse; carpels 4–6 mm. long, gradually tapering into a slender style 1–1.5 cm. long.

TYPE LOCALITY: Misty Harbor, Nagai Island, Alaska.
DISTRIBUTION: Coast of southern Alaska.

4. **Rhodiola integrifolia** Raf. Atl. Jour. 1 : 146. 1832.

Sedum rhodioloides Raf. *loc. cit.* 1832.
Sedum Rhodiola Torr. Ann. Lyc. N. Y. 2 : 206. 1827. Not *S. Rhodiola* DC. 1805.
Sedum frigidum Rydb. Bull. Torrey Club 28 : 282. 1901.

Dioecious; rootstock fleshy. Stems low, usually less than 1 dm. high; leaves obovate to oblong-obovate, sessile, 1–1.5 cm. long, 5–7 mm. wide, dentate above the middle or entire, acute; cyme dense, usually dark-purple; flowers usually 5-merous; calyx-segments lanceolate, acute, 1.5–2 mm. long; petals oblanceolate to oblong, acute, about 3 mm. long, dark-purple or rarely greenish-purple, those of the pistillate flowers shorter and less acute; filaments purple, about one-third longer than the petals; follicles 3–5 mm. long, oblong, the beak about 0.5 mm. long, divergent or recurved.

TYPE LOCALITY: On the Rocky Mountains.
DISTRIBUTION: High mountains of Colorado, Nevada and California to Alaska.

5. **Rhodiola polygama** (Rydb.) Britton & Rose, Bull. N. Y. Bot. Gard. 3 : 39. 1903.

Sedum polygamum Rydb. Bull. Torrey Club 28 : 283. 1901.

Rootstock thick, fleshy. Stems rather stout, 1–3 dm. tall; leaves obovate to oblanceolate, sessile, acute, entire or minutely denticulate, 1.5–2.5 cm. long; cyme dense, dark-purple; flowers polygamo-dioecious; calyx-segments lanceolate, acute, 2 mm. long; petals oblanceolate, 3 mm. long, dark-purple; filaments about one-half longer than the petals, purple, abruptly narrowed above; follicles 6–8 mm. long, the ascending or spreading beak about 1 mm. long.

TYPE LOCALITY: West Spanish Peak, Colorado.
DISTRIBUTION: Mountains of Colorado.

6. **Rhodiola roanensis** Britton, Bull. N. Y. Bot. Gard. 3: 39. 1903.

Sedum roanense Britton; Small, Fl. SE. U. S. 497. 1903.

Stems tufted, stout, leafy, 1.5–2.7 dm. high. Leaves oblanceolate, entire, or rarely with 1 or 2 minute teeth, obtusish or acute, narrowed at the base, 2–3 cm. long, 5–9 mm. wide, the lower much smaller and shorter; cymes dense, 2–3 cm. broad; flowers very short-pedicelled; petals lanceolate, purple, or purplish; follicles 8–10 mm. long, the short widely spreading beak about 1 mm. long.

TYPE LOCALITY: Roan Mountain, Mitchell County, North Carolina.
DISTRIBUTION: Summit of Roan Mountain.

23. **SEDASTRUM** Rose, gen. nov.

Cespitose perennials; stems numerous, arising from dense basal rosettes of leaves and dying down to the base after flowering. Stem-leaves alternate, fleshy but more or less flattened, usually broad. Inflorescence more or less paniculate and leafy; the branches arising from the axils of leaves, bearing scattered sessile flowers. Calyx green, deeply cleft. Corolla white or at least whitish, with usually distinct spreading lobes. Stamens 8 or 10, the 4 or 5 opposite the sepals distinct, the others borne on the petals. Carpels ovate, erect, concave under the scales, the styles slender, little if at all spreading.

Type species, *Sedum incertum* Hemsley.

Plants glabrous throughout. — 1. *S. glabrum.*
Plants more or less pubescent, especially the rosette of leaves.
  Stem leaves narrow, several times longer than broad.
    Leaves linear-oblong, very pubescent. — 2. *S. Hemsleyanum.*
    Leaves oblanceolate, slightly hairy. — 3. *S. Painteri.*
  Stem leaves orbicular to broadly oblong, little if at all longer than broad.
    Stems as well as leaves pubescent.
      Stems very pubescent, green. — 4. *S. ebracteatum.*
      Stems slightly pubescent becoming purplish. — 5. *S. rubricaule.*
    Stems glabrous or nearly so.
      Leaves ovate, more or less pointed, thin for the genus. — 6. *S. chalapense.*
      Leaves oval, obtusish. — 7. *S. incertum.*

1. **Sedastrum glabrum** Rose, sp. nov.

Perennial with rather large rosettes of leaves, these ovate, obtuse, and very thick especially in the upper half, glabrous. Stems about 20 cm. long, leafy throughout, glabrous; flowering branches bearing a few sessile flowers; sepals ovate, obtuse; petals white, spreading, obtuse; carpels erect, hollowed about the gland.

Collected at Saltillo, Mexico, by Dr. E. Palmer in 1896 (*no. 585*, type) and in 1902.

2. **Sedastrum Hemsleyanum** Rose.

Sedum Hemsleyanum Rose, Bull. N. Y. Bot. Gard. 3: 41. 1903.

Perennial, caulescent, 1–3 dm. high, branching, puberulent. Inflorescence an elongated panicle; flowers sessile, arranged along one side of the axes; calyx-lobes broadly ovate, obtuse, 1.5 mm. long; petals white, 4 mm. long, ovate, acuminate; carpels 5, tipped with long slender styles.

TYPE LOCALITY: Near Oaxaca City, Mexico.
DISTRIBUTION: Oaxaca, Puebla, Vera Cruz.

3. **Sedastrum Painteri** Rose, sp. nov.

Perennial; basal rosettes of small spatulate leaves somewhat pubescent on the margin, about 1 cm. long, flat but fleshy. Stems glabrous or nearly so, somewhat colored by reddish longitudinal lines; leaves turgid, 1–1.5 cm. long, with a broad half-clasping base, obtuse, glabrous or nearly so; inflorescence few-branched; flowers sessile; calyx deeply parted, the lobes erect, green; corolla white, the lobes widely spreading; stamens 10 (or 8), free to the base, 5 inserted on the corolla-lobes one fourth the distance above the base; carpels 4 or 5, erect, with slender styles.

Collected by J. N. Rose and Jos. H. Painter near Cuernavaca, Mexico, September, 1903 (*no. 796*), and described from specimens which flowered in Washington in November, 1903. Here is doubtless to be referred Bourgeau's *no. 1182* also from Cuernavaca, referred to but not named by Mr. Hemsley in Biol. Centr. Am. Bot. 1: 396.

4. **Sedastrum ebracteatum** (Moç. & Sessé) Rose.

Sedum ebracteatum Moç. & Sessé, in DC. Mem. Crass. 37, *pl. 6, B.* 1828.

Leaves in dense sessile rosettes, obovate or spatulate, flattened but fleshy, 2–3 cm. long, either ciliate on margins, or both surfaces (at least when young) covered with stiff hairs. Flowering stems rather weak, about 3 dm. high, ascending or procumbent, more or less mottled with red, pubescent, leafy, somewhat branching; stem-leaves somewhat similar to basal ones but broader at base; flowers sessile or short-pedicelled; sepals 5, very unequal and leaf-like; petals 4 or 5, whitish, the midrib greenish, spreading when first opening, longer than the sepals; stamens 8 or 10; hypogynous scales thickish, ligulate.

TYPE LOCALITY: Mexico.
DISTRIBUTION: Hidalgo.
ILLUSTRATION: DC. *loc. cit.*

5. **Sedastrum rubricaule** Rose, sp. nov.

Stems about 30 cm. high, somewhat pubescent, greenish below, purplish above. Basal rosettes dense; leaves ovate, thick, rather obtuse; stem-leaves acutish, bright green; flowers on ultimate branches 3 or 4, sessile; calyx green, cleft to near the middle; petals broadly ovate, white; stamens erect; anthers yellowish; carpels erect.

Collected by Dr. E. Palmer near Concepcion del Oro, State of Zacatecas, Mexico, November 22, 1902 (*no. 386*). These specimens flowered in Washington in October and November, 1903.

6. **Sedastrum chapalense** (S. Wats.) Rose.

Sedum chapalense S. Wats. Proc. Am. Acad. **22**: 411. 1887.

Stems about 10 cm. high, much branched, yellowish-green, glabrous. Leaves slightly pubescent, those of the sterile shoots obovate or ovate, acutish, 12 mm. long, the stem-leaves rather thin for the genus; flowers sessile, arranged along one side of the axis; calyx 5-parted, its lobes unequal, obtuse or acute; petals white, oblong-ovate, acute, 4 mm. long; scales small.

TYPE LOCALITY: Chapala, Jalisco, Mexico.
DISTRIBUTION: Jalisco.

7. **Sedastrum incertum** (Hemsl.) Rose.

Sedum incertum Hemsl. Diag. Pl. Nov. 1: 11. 1878.

Stems rather thick, either clambering or hanging over rocks, 3–4 dm. long. Leaves fleshy, slightly pubescent, broadly ovate, in herbarium specimens with nearly rounded apex, 2–3 cm. long; flowers in rather short interrupted spikes; calyx-lobes ovate, obtuse; petals white drying with a yellow tinge.

TYPE LOCALITY: Valley of Mexico.
DISTRIBUTION: Valley of Mexico.

24. **TETRORUM** Rose, gen. nov.

Low, diffuse annuals. Calyx minute, its lobes broader than high. Petals purple, obtuse, distinct. Stamens 10. Scales large. Carpels 4, widely spreading in age, distinct, constricted at base, many seeded. Style minute.

Type species, *Sedum pusillum* Michx.

1. **Tetrorum pusillum** (Michx.) Rose.

Sedum pusillum Michx. Fl. Bor. Am. 1: 276. 1803.

Annual, pale-green, glabrous. Stems usually branched near the base, leafy above, 5–30 cm. high; leaves terete or nearly so, linear, sessile, obtuse, 1–2 cm. long; branches of the cyme 2–6 cm. long; pedicels 2–6 mm. long; calyx-segments linear to linear-oblong, obtuse; petals purple, oblong, scarcely twice as long as the calyx-segments; follicles slender, about 5 mm long, tapering into the subulate styles.

TYPE LOCALITY: Flatrock, North Carolina.
DISTRIBUTION: On mountain rocks, North Carolina and Georgia.

25. SEDUM L. Sp. Pl. 430. 1753.

Fleshy mostly glabrous herbs, erect or decumbent, mainly with alternate, often imbricated, entire or dentate leaves, and perfect flowers in terminal often 1-sided cymes. Calyx 4–5-lobed or 4–5-parted. Petals 4 or 5, distinct or some of them united at the very base. Stamens 8–10, perigynous, the alternate ones usually attached to the petals. Filaments filiform or subulate. Scales of the receptacle entire or emarginate. Carpels 4 or 5, distinct, or united at the very base; styles usually short; ovules numerous. Follicles many-seeded or few-seeded.

Type species, *Sedum Telephium* L.

1. Flowers not corymbose.

A. Leaves densely imbricated, short.

Petals yellow.
- Leaves ascending, not closely appressed.
  - Leaves ovate; introduced European species. — 1. *S. acre.*
  - Leaves ovate-oblong; Mexican species. — 2. *S. Greggii.*
- Leaves closely appressed. — 3. *S. muscoideum.*

Petals reddish, white or pink.
- Leaves linear-oblong, papillose; petals reddish. — 4. *S. alamosanum.*
- Leaves ovate.
  - Flowers white. — 5. *S. submontanum.*
  - Flowers pink or pinkish.
    - Carpels spreading; leaves not fleshy. — 6. *S. cupressoides.*
    - Carpels erect; leaves fleshy, scarious at the base. — 7. *S. moranense.*

B. Leaves not imbricated, excepting those of rosettes, alternate or rarely opposite or whorled.

a. Leaves linear, linear-lanceolate or oblong, terete or nearly so.

* Annual or biennial species (or no. 13 perennial).
- Flowers cymose, the cyme-branches long.
  - Follicles ascending.
    - Plants glabrous.
      - Leaves oblong to linear-oblong; petals bright-yellow. — 8. *S. annuum.*
      - Leaves long-linear; petals white or pinkish. — 9. *S. pulchellum.*
    - Plant glandular-pubescent above; petals red. — 10. *S. villosum.*
  - Follicles widely divergent; petals yellow. — 11. *S. Nuttallianum.*
- Flowers solitary or in pairs; petals white or rose.
  - Roots fibrous. — 12. *S. Forreri.*
  - Roots napiform. — 13. *S. napiferum.*

** Perennial species.
- Flowers white to rose, red or purple.
  - Leaves linear to linear-lanceolate.
    - Rootstock not tuberiferous.
      - Petals white, tinged with purple.
        - Herbaceous. — 14. *S. stelliforme.*
        - Shrubby. — 15. *S. Bourgaei.*
      - Petals red. — 16. *S. calcaratum.*
    - Rootstock tuberiferous.
      - Flowers white. — 17. *S. guadalajaranum.*
      - Flowers purple. — 18. *S. oxycoccoides.*
  - Leaves oblong. — 19. *S. diffusum.*
- Flowers yellow.
  - Leaves linear, alternate, glabrous.
    - Flowers distinctly pedicelled. — 20. *S. guatemalense.*
    - Flowers sessile or subsessile.
      - Calyx-segments manifestly unequal. — 21. *S. mexicanum.*
      - Calyx-segments all alike or nearly so.
        - Plant 7–15 cm. high; species of western North America. — 22. *S. stenopetalum.*
        - Plant 2–3 dm. high; introduced European species. — 23. *S. reflexum.*
  - Leaves oblong, opposite, softly pubescent. — 24. *S. Stahlii.*

b. Leaves oblong to lanceolate or spatulate, more or less flattened.

* Leaves, at least those of flowering stems, lanceolate to ovate or oblong, mostly broadest at or near the base.
- Annual species, 10 cm. high or less.
  - Petals yellow; follicles widely divergent. — 25. *S. radiatum.*
  - Petals white to rose.
    - Roots fibrous. — 26. *S. vinicolor.*
    - Roots tuberous.
      - Plant 5 to 8 cm. high; calyx-segments 2 mm. long. — 27. *S. Pringlei.*
      - Plant 2 cm. high or less; calyx-segments 3 to 3.5 mm. long. — 28. *S. minimum.*
- Perennial species.
  - Leaves oblong, 1 cm. long or less. — 29. *S. australe.*
  - Leaves lanceolate to linear-lanceolate, 6 mm. long or more.

Ire Images glorieuse. Mat. 27:4

× Leaves journal, juste assez cadre "Chemin de Lumière"
au Lauue 16 Rue 68 Wilhelm Tiergarten
Th. M. Dec. 1905

Petals yellow.
Leaves not ciliate.
Leaves linear-lanceolate, scarious. 30. *S. Douglasii.*
Leaves oblong-lanceolate, green. 31. *S. shastense.*
Leaves, at least the lower ones, ciliate. 32. *S. ciliosum.*
Petal white, tinged with pink. 33. *S. Cockerellii.*
** Leaves spatulate to obovate, narrowed at the base.
Annual species.
Flowers close together on the cyme-branches. 34. *S. naviculare.*
Flowers distant on the long leafy cyme-branches. 35. *S. jaliscanum.*
Perennial species.
Shrubby species with relatively broad leaves.
Petals white.
Flowers pedicelled. 36. *S. tortuosum.*
Flowers sessile or subsessile.
Bark granular or tuberculate.
Carpels 6 to 8; petals acute, keeled. 37. *S. retusum.*
Carpels 5; petals mucronate below the apex. 38. *S. tuberculatum.*
Bark puberulent, not granular nor tuberculate. 39. *S. Conzattii.*
Petals yellow, orange or red.
Petals purplish-red. 40. *S. oxypetalum.*
Petals yellow to orange.
Flowers pedicelled.
Flowers nodding. 41. *S. Botteri.*
Flowers not nodding. 42. *S. Nelsoni.*
Flowers sessile or subsessile.
Leaves pale and glaucous. 43. *S. Palmeri.*
Leaves bright green, not glaucous.
Leaves distinctly retuse at the apex. 44. *S. Purpusi.*
Leaves not retuse.
Leaves broad, obliquely truncate at the apex. 45. *S. dendroideum.*
Leaves narrow, acutish.
Leaves obovate. 46. *S. confusum.*
Leaves oblanceolate. 47. *S. praealtum.*
Decumbent or tufted species with erect or ascending flowering stems.
Leaves, or some of them, verticillate in 3's. 48. *S. ternatum.*
Leaves alternate or rarely opposite.
Flowers white to purple.
Flowers slender-pedicelled.
Leaves with a filiform terminal appendage; petals white below, reddish above. 49. *S. filiferum.*
Leaves not appendaged; petals purple. 50. *S. longipes.*
Flowers sessile or short-pedicelled.
Plants pubescent or puberulent-granular, at least above.
Petals 5 mm. long; basal leaves spatulate, hirsute. 51. *S. Lumholtzii.*
Petals 6–7 mm. long; basal leaves obovate, glabrous or papillose. 52. *S. Wootoni.*
– Leaves turgid, the basal ones smooth.
– Leaves flattish, at least the basal ones papillose.
Plant papillose all over; sepals 3 mm. long. 53. *S. puberulum.*
Sepals not papillose, 5 mm. long. 54. *S. Griffithsii.*
Plants glabrous.
Calyx-segments acute to acuminate; petals white. 55. *S. californicum.*
Calyx-segments obtuse.
Petals obtuse or apiculate.
Petals purple; carpels widely divergent; Mexican species. 56. *S. madrense.*
Petals white, tinged with rose; carpels ascending; Alleghenian species. 57. *S. Nevii.*
Petals acute; Texan and Mexican species. 58. *S. Wrightii.*
Flowers yellow.
Flowers cymose.
Follicles ascending, or nearly erect.
Basal leaves spatulate; plants glaucous or white-pruinose.
Plant densely white-pruinose; basal leaves broadly spatulate. 59. *S. pruinosum.*
Plants pale-green or glaucous or somewhat pruinose; basal leaves spatulate.
Petals 6–7 mm. long; leaf-margins slightly papillose. 60. *S. anomalum.*
Petals 8–10 mm. long; leaves with a line of pits near the margin on the under side. 61. *S. spathulifolium.*
Basal leaves obovate-orbicular; plant not glaucous. 62. *S. yosemitense.*
Follicles widely divergent.
Branches of the cyme short, mostly simple; leaves, at least those of sterile shoots, opposite. 63. *S. divergens.*
Branches of the cyme long, forked; leaves alternate.
Biennial. 64. *S. Leibergii.*

Perennial, forming offsets and rosettes.	65. *S. Woodii.*
Flowers solitary, terminal.	66. *S. diversifolium.*
Leaves obovate, toothed, opposite; introduced species.	67. *S. stoloniferum.*

2. Flowers corymbose.

Petals purple, twice as long as the sepals.	68. *S. Fabaria.*
Petals pink, 3–4 times as long as the sepals.	69. *S. telephioides.*

1. **Sedum acre** L. Sp. Pl. 432. 1753.

Perennial, densely tufted, matted, glabrous; sterile branches prostrate, the flowering ones 2–8 cm. high. Leaves sessile, alternate, ovate, thick, imbricated, yellowish-green, entire, about 3 mm. long; cyme 2–3-forked, its branches 1–2.5 cm. long; flowers sessile, about 8 mm. broad; petals yellow, linear-lanceolate, acute, 3–4 times as long as the ovate sepals; follicles spreading, 3–4 mm. long, tipped with a slender style.

TYPE LOCALITY: In dry sterile fields, Europe.
DISTRIBUTION: On rocks and along roads, Nova Scotia to Ontario, New York, Pennsylvania and Virginia. Naturalized from Europe.
ILLUSTRATIONS: DC. Pl. Grasses *pl. 117*; Engl. Bot. *pl. 839*; Fl. Deutsch. ed. 5. *pl. 2649*; Britt. & Brown, Ill. Fl. *f. 1813*.

2. **Sedum Greggii** Hemsl. Diag. Pl. Nov. **1**: 12. 1878.

Perennial, glabrous; flowering branches slender, 7–15 cm. tall. Leaves elliptic to obovate-oblong, imbricated, obtuse, 4–7 mm. long; sterile branches apparently prostrate or ascending, shorter than the flowering ones; flowers yellow, about 10 mm. broad, sessile or very short-pedicelled, 3–5 together in a simple terminal cyme; calyx-segments oblong to elliptic, obtuse; petals ovate-lanceolate, keeled, acute, twice as long as the calyx; filaments filiform; scales linear-oblong; carpels 5, ovoid, tipped with long subulate styles.

TYPE LOCALITY: Real del Monte, Mexico.
DISTRIBUTION: Hidalgo; San Luis Potosi; Tamaulipas.

3. **Sedum muscoideum** Rose, Bull. N. Y. Bot. Gard. **3**: 39. 1903.

Perennial, with branching creeping stems. Leaves appressed, and closely set on the branches, minute, thickish, obtuse; inflorescence much reduced, consisting of 1 or 2 sessile flowers at the ends of branches; calyx-lobes obtuse, ovate, 1 mm. long; corolla yellow; petals lanceolate, 3.5 cm. long, a little longer than the stamens.

TYPE LOCALITY: Arrihade Papalo, Oaxaca, Mexico.
DISTRIBUTION: Known only from the type locality.

4. **Sedum alamosanum** S. Wats. Proc. Am. Acad. **25**: 148. 1890.

Perennial with branching rootstocks, sending up numerous erect flowering stems, 6–10 cm. tall. Leaves crowded, linear-oblong, terete, 3–4 mm. long, standing at right angles to the stem, minutely papillose-roughened but not "puberulent" as originally described; inflorescence a small few-branched cyme but sometimes (as in the type) reduced to a secund raceme; pedicels short; sepals terete, obtuse in fresh specimens, 3 mm. long; petals widely spreading, lanceolate, acute, whitish but drying reddish, 5 mm. long; carpels erect.

TYPE LOCALITY: Alamos Mountains, Sonora, Mexico.
DISTRIBUTION: Mountains of northwestern Mexico where it is known only from a few localities in Sonora and Chihuahua.

5. **Sedum submontanum** Rose, Bull. N. Y. Bot. Gard. **3**: 40. 1903.

Perennial, much branched and spreading, glabrous throughout. Leaves very closely set or even imbricated, small, 3–5 mm. long, short-oblong, rounded at tip, free at base, fleshy; flowers few, in short-branched cymes, sessile; calyx-lobes leaf-like, short, 1–2 mm. long, rounded at apex; petals narrow, white (or if pink very pale), 5–6 mm. long; scales small, retuse at apex; carpels spreading above.

TYPE LOCALITY: Monte Escobado, Zacatecas, Mexico.
DISTRIBUTION: Zacatecas; Jalisco.

See Krueger, Semin. Arth. & Rh., 55: 211

6. **Sedum cupressoides** Hemsl. Diag. Pl. Nov. 1: 11. 1878.

Perennial, suffruticose, procumbent, much branched. Flowering branches erect, very slender; leaves small, 2 mm. long, thick, ovate, terete, densely appressed, imbricated, obtuse; flowers sessile, solitary or 2 or 3 at the tops of branches, yellow (but described as rose-colored); calyx 5-lobed, the lobes obtuse; petals 4–5 mm. long; carpels widely spreading in age.

TYPE LOCALITY: Mountains of Oaxaca, Mexico.
DISTRIBUTION: Oaxaca.
ILLUSTRATION: Hemsl. Biol. Centr. Am. Bot. *pl. 21.*

7. **Sedum moranense** H. B. K. Nov. Gen. & Sp. 6: 44. 1823.

Sedum Liebmannianum Hemsl. Diag. Pl. Nov. 1: 12. 1878.

Perennial, procumbent, much branched, rooting at the nodes. Leaves glabrous, minute, 1–3 mm. long, thick, turgid, obtuse, densely appressed, imbricated; flowers in short secund racemes or only one or two at the tips of branches; pedicels very short; sepals linear-oblong, somewhat unequal, fleshy, produced backward at base; petals reddish, 5 mm. long, lanceolate; carpels erect, at least at first.

TYPE LOCALITY: Real del Moran, Hidalgo, Mexico.
DISTRIBUTION: Central Mexico.

8. **Sedum annuum** L. Sp. Pl. 432. 1753.

Annual, with fibrous roots, glabrous. Stems tufted, 5–8 cm. high, ascending or erect, branched. Leaves linear-oblong, obtuse, terete, somewhat flattened above, 2–4 mm. long; flowers subsessile on the branches of the cyme, more or less unilateral, about 1 cm. broad; calyx-segments oblong to ovate-oblong, obtuse; petals bright-yellow, lanceolate, sharply acute, twice as long as the calyx; follicles short-tipped.

TYPE LOCALITY: Northern Europe.
DISTRIBUTION: Greenland, northern and central Europe.
ILLUSTRATIONS: Fl. Deutsch. ed. 5. *pl. 2646.*

9. **Sedum pulchellum** Michx. Fl. Bor. Am. 1: 277. 1803.

Sedum linifolium Nutt.; T. & G. Fl. N. Am. 1: 559, as synonym. 1840.

Glabrous, ascending or trailing, branched, 1–3 dm. long. Leaves crowded, terete, linear, sessile, obtuse, slightly auriculate at the base, 6–25 mm. long, about 2 mm. wide; cyme 4–7-forked, its branches spreading or recurved in flower; flowers sessile, close together, 8–12 mm. broad; petals linear-lanceolate, acute, about twice the length of the lanceolate obtusish sepals; follicles 4–6 mm. long, tipped with slender styles.

TYPE LOCALITY: Rocks about Nashville, Tenn.
DISTRIBUTION: On rocks, Virginia to Georgia, Indiana, Missouri and Texas.
ILLUSTRATION: Britt. & Brown, Ill. Fl. *f. 1817.*

10. **Sedum villosum** L. Sp. Pl. 432. 1753.

Biennial, glandular-pubescent; stems erect, 8–20 cm. high. Leaves linear to linear-oblong, obtuse, nearly terete, 5–10 mm. long, erect; cyme paniculate, small; pedicels slender, mostly longer than the flowers; calyx-segments oblong, obtuse; petals ovate, acute or acutish, about twice as long as the calyx, rose-red or pink, with a purplish back; follicles suberect with ascending slender tips.

TYPE LOCALITY: Wet pastures, Germany, England, France.
DISTRIBUTION: Greenland; Europe.
ILLUSTRATIONS: DC. Pl. Grasses *pl. 70;* Engl. Bot. *pl. 394;* Fl. Deutsch. ed. 5. *pl. 2644.*

11. **Sedum Nuttallianum** Raf. Atl. Jour. 1: 146. 1832.

Sedum Torreyi Don, Gard. Dict. 3: 121. 1834.
Sedum sparsiflorum Nutt.; T. & G. Fl. N. Am. 1: 559. 1840.

Annual, pale-green, low, tufted, glabrous, 5–8 cm. high. Leaves alternate, linear-oblong, teretish, obtuse, sessile, entire, 4–15 mm. long; cyme 2–5 forked, its branches

1–5 cm. long; flowers sessile or very short-pedicelled, about 7 mm. broad; petals yellow, lanceolate, acute; follicles divergent, tipped with short subulate styles.

TYPE LOCALITY: Near the Rocky Mountains.
DISTRIBUTION: In dry soil, Missouri and Arkansas to Texas.
ILLUSTRATION: Britt. & Brown, Ill. Fl. *f. 1814.*

12. **Sedum Forreri** Greene, Pittonia **1**: 162. 1888.

Sedum divergens Greene, Pittonia 1: 154. 1888. Not *S. divergens* S. Wats. 1882.

Annual, roots fibrous. Plant 5–8 cm. high, divergently branched; leaves narrowly oval or oblong, 2–5 mm. long, two or three times as long as wide, obtuse, sessile by a somewhat broader base; flowers solitary or in pairs at the ends of the branches, 8–10 mm. broad; calyx-segments oblong-lanceolate, obtuse, about one-half as long as the oblong-linear obtuse, white or faintly pink petals.

TYPE LOCALITY: Higher Sierra Nevada back of the city of Durango, Mexico.
DISTRIBUTION: Known only from the type locality.

13. **Sedum napiferum** Peyritsch, Linnaea **30**: 50. 1859.

Probably perennial although described as annual, with a thickened root, much branched, 3–4 cm. high, glabrous throughout. Basal leaves not seen; stem-leaves (in dried specimens) lanceolate, 3–5 mm. long, produced backward at base; inflorescence a few–flowered cyme; pedicels 3 mm. long or less; calyx-segments ovate, obtuse, about 2 mm. long; petals rose-colored, 4–5 mm. long; carpels widely spreading in age.

TYPE LOCALITY: Near the city of Toluca, Mexico.
DISTRIBUTION: Type locality and vicinity.

14. **Sedum stelliforme** S. Wats. Proc. Am. Acad. **20**: 365. 1885.

Perennial by a rootstock; stems leafy, simple or branched, 5–12 cm. high, glabrous. Leaves linear to linear-lanceolate, scattered, obtuse, 4–9 mm. long, about 2 mm. wide; cyme few-forked, its branches 3 cm. long or less; pedicels very short; calyx-segments lanceolate to oblong-lanceolate, blunt; petals white tinged with purple, about 6 mm. long, lanceolate, acuminate, twice as long as the calyx and about equaling the stamens; follicles about 4 mm. long, subulate-tipped, widely divergent.

TYPE LOCALITY: Huachuca Mountains, southern Arizona.
DISTRIBUTION: Mountains of New Mexico, Arizona and Chihuahua.

15. **Sedum Bourgaei** Hemsl. Diag. Pl. Nov. **1**: 11. 1878.

Shrubby, very much branched, the branches slender and woody. Leaves numerous, alternate, terete, linear, obtuse, 1–2 cm. long; inflorescence a small lax few-branched cyme; flowers short-pedicelled; calyx-lobes leaf-like, very unequal, distinct, produced backward at base; petals white or pinkish (described as probably yellow), lanceolate, acute, 8 mm. long; carpels slightly spreading.

TYPE LOCALITY: San Nicolas, Valley of Mexico.
DISTRIBUTION: High valleys and mountains of Central Mexico.
ILLUSTRATION: Hemsl. Biol. Centr. Am. Bot. *pl. 20.*

16. **Sedum calcaratum** Rose, Bull. N. Y. Bot. Gard. **3**: 40. 1903.

Perennial (?), much branched, 5–8 cm. high, glabrous, more or less purple. Leaves linear, "cylindrical," obtuse, 10–12 mm. long, alternate and scattered; flowers arranged along one side of the branches, subsessile; calyx-lobes 5, somewhat unequal, 2–3 mm. long, green; stamens 10; scales linear, about two-thirds the length of the filaments; petals red, 5 mm. long, obtuse; carpels 5, widely spreading when mature, with long mucronate tips.

TYPE LOCALITY: El Salto near Dublan, Hidalgo, Mexico.
DISTRIBUTION: Known only from the type locality.

17. **Sedum guadalajaranum** S. Wats. Proc. Am. Acad. **22**: 411. 1887.

Perennial by a branching rootstock, forming tuberous-thickened roots, much branched at base, 1–2 dm. high, somewhat roughened, hardly "puberulent." Stem-leaves thickly

Nr 15 a Sedeem Limonum Hooper
Journ. Bot. LV: 43. 1917.

See Praeger, Journ. Roy. Soc. 55: 214

× Sedum rubrum Bigelow, Plant. Kiaer. Lief.
Mount. Reg. Coll. Vet. Studies, 1: 61. 1905

set, but not closely imbricated, spreading, narrowly linear, projecting below the attachment to the stem but not "clasping," glabrous, slightly glaucous, 6–15 mm. long; inflorescence cymose; flowers short-pedicelled or subsessile; sepals linear, slightly unequal, quite distinct; petals white or somewhat tinged with red, linear, acuminate, distinct, 3 mm. long; carpels spreading in age.

TYPE LOCALITY: Rio Blanco, Jalisco, Mexico.
DISTRIBUTION: Jalisco.

18. **Sedum oxycoccoides** Rose, Bull. N. Y. Bot. Gard. **3**: 40. 1903.

Perennial by creeping fleshy rootstocks, with many slender branches arising from the base; glabrous throughout. Leaves numerous, linear, 8–15 mm. long; flowers in small few-branched cymes, sessile or sometimes short-pedicelled; calyx-segments linear, leaf-like, somewhat unequal, the longer ones as long as the petals; petals deep-red, lanceolate, acuminate, 10 mm. long, longer than the reddish stamens; carpels free to base, spreading.

TYPE LOCALITY: Santa Teresa, Tepic, Mexico.
DISTRIBUTION: Known only from the type locality.

19. **Sedum diffusum** S. Wats. Proc. Am. Acad. **25**: 148. 1890.

Rootstock widely branched, fleshy; stem short, the slender branches spreading, 1.5 dm. long or less, glabrous, very leafy. Leaves sessile or somewhat clasping, narrowly oblong, obtuse, 4–9 mm. long; flowers sessile in secund spikes at the ends of the branches, mostly longer than the bracts; calyx-segments ovate, obtuse; petals 4–6 mm. long, twice as long as the calyx, white, narrowly oblong, acute; stamens very short; follicles widely divergent, abruptly subulate-tipped.

TYPE LOCALITY: Dry limestone ledges in the Sierra de la Silla, near Monterey, Mexico.
DISTRIBUTION: Known only from the type locality.

20. **Sedum guatemalense** Hemsl. Diag. Pl. Nov. **1**: 11. 1878.

Perennial, procumbent, rooting at the joints; branches woody, tuberculately roughened. Leaves numerous, terete, obtuse, 6–7 mm. long, glabrous; inflorescence a short compact cyme; calyx-segments leaf-like, half as long as the petals; petals reddish-yellow, 7 mm. long, mucronate on the back below the apex; carpels widely spreading when mature.

TYPE LOCALITY: Above Calderas, Guatemala.
DISTRIBUTION: Guatemala.

21. **Sedum mexicanum** Britton, Bull. N. Y. Bot. Gard. **1**: 257. 1899.

Perennial, herbaceous; stems brittle, weak, spreading, 1–2 dm. long. Leaves linear, sessile, compressed, tapering to a blunt tip, scattered, or those of sterile shoots and the lower part of flowering ones opposite or verticillate, 8–20 mm. long, about 2 mm. wide; branches of the cyme mostly 2-forked, 4–8 cm. long; flowers sessile, close together; bracts longer than the similar calyx-segments; petals golden-yellow, oblong, acute, concave, widely spreading, tapering into a short claw, 5–6 mm. long, 1.5 mm. wide, a little longer than the two outer calyx-segments, twice as long as the three inner ones; filaments nearly as long as the petals; styles subulate.

TYPE LOCALITY: Raised from seeds collected near the City of Mexico.
DISTRIBUTION: Mexico.

22. **Sedum stenopetalum** Pursh, Fl. Am. Sept. 324. 1814.

Sedum coerulescens Haw. Phil. Mag. **1825**: 174. According to Ind. Kew.
Sedum lanceolatum Torr. Ann. Lyc. N. Y. **2**: 205. 1827.
? Sedum subclavatum Haw. Phil. Mag. **1831**: 414.
Sedum stenopetalum forma *rubrolineatum* Cockerell, Bull. Torrey Club **18**: 169. 1891.

Perennial, tufted, glabrous; flowering branches 8–18 cm. high. Leaves alternate, crowded but scarcely imbricated, except on the sterile shoots, sessile, linear, 6–16 mm. long, entire; cyme 3–7-forked, compact; flowers mostly short-pedicelled, 8–10 mm. broad;

petals narrowly lanceolate, very acute, yellow; follicles about 4 mm. long, the subulate style-tips at length somewhat divergent.

TYPE LOCALITY: On rocks on the banks of Clark's River and Kooskoosky.
DISTRIBUTION: In dry rocky soil, South Dakota to Alberta, Nebraska, New Mexico and California.
ILLUSTRATIONS: Regel, Gartenflora 1872: *pl. 741a*, Britt. & Brown, Ill. Fl. *f. 1815*.

23. **Sedum reflexum** L. Sp. Pl. ed. 2. 618. 1762.

Perennial by a creeping stem producing numerous short barren shoots; flowering branches erect. Leaves alternate, sessile, imbricated on the sterile shoots, terete, somewhat spurred at the base, 6–18 mm. long; cyme 4–8-forked, its branches recurved in flower; flowers 8–12 mm. broad; petals linear, yellow, two to three times as long as the short ovate sepals; follicles about 3 mm. long, tipped with a slender somewhat divergent style.

TYPE LOCALITY: Europe, at the base of mountains.
DISTRIBUTION: Massachusetts and New York, escaped from gardens. Native of Europe.
ILLUSTRATIONS: DC. Pl. Grasses *pl. 116*; Engl. Bot. *pl. 695*; Fl. Deutsch. ed. 5. *pl. 2652*; Britt. & Brown, Ill. Fl. *f. 1816*.

24. **Sedum Stahlii** Solms, Sam. Bot. Gart. Strassb. **1900**: 4. 1900.

Perennial, much branched, green or tinged with red, very fleshy, finely pubescent, the branches weak, spreading, 2 dm. long or less, or the flowering ones ascending. Leaves opposite or subopposite, sessile, ovoid-oblong, obtuse, nearly round in cross-section, 1–2 cm. long, about half as thick as long, reddish; cymes terminal, few-forked, the recurved branches 6 cm. long or less; flowers almost sessile; sepals narrowly oblong, obtuse, puberulent, about half as long as the petals; petals bright-yellow, lanceolate, spreading, about 8 mm. long, acuminate, with a short horn-like appendage below the tip on the outer side; stamens shorter than the petals; carpels erect.

TYPE LOCALITY: Near Tehuacan, Puebla, Mexico.
DISTRIBUTION: Known only from the type locality.
ILLUSTRATION: Bot. Mag. *pl. 7908*.

25. **Sedum radiatum** S. Wats. Proc. Am. Acad. **18**: 193. 1883.

Annual, propagating by deciduous buds formed in the axils of the lowest leaves, or perhaps perennial by basal rosettes; stems simple or branched, 7–15 cm. high, decumbent at the base. Leaves oblong to ovate-oblong, obtuse or acutish, somewhat clasping, 5–12 mm. long, 2–4 mm. wide, papillose and veiny when dry; cymes several-forked; flowers sessile; calyx-segments much shorter than the petals, triangular, acute; petals yellow, narrowly lanceolate, acuminate, 7–12 mm. long; follicles subulate-tipped, 3–4 mm. long, widely divergent from the slightly united bases.

TYPE LOCALITY: Coast ranges of California.
DISTRIBUTION: California and Oregon.

26. **Sedum vinicolor** S. Wats. Proc. Am. Acad. **21**: 428. 1886.

Annual or seemingly so, 4–8 cm. high, diffusely branched throughout, glabrous and reddish. Basal leaves not seen; stem-leaves closely set, ovate to narrowly oblong, 4–6 mm. long, green or purplish, obtuse; inflorescence cymose, few-flowered; pedicels 2–4 mm. long; sepals distinct or nearly so, oblong-ovate, obtuse, extending backward below the point of attachment, 2 mm. long; petals white or purplish, twice as long as the petals; carpels widely spreading.

TYPE LOCALITY: Norogachi, Chihuahua, Mexico.
DISTRIBUTION: Mountains of Chihuahua.

27. **Sedum Pringlei** S. Wats. Proc. Am. Acad. **23**: 273. 1888.

Annual or seemingly so, 5–8 cm. high, erect and somewhat branching, glabrous, tuberiferous; basal leaves not seen. Stem-leaves sessile, oblong-lanceolate, obtuse, 6 mm. long; inflorescence cymose, few-flowered; pedicels short, 2–3 mm. long; sepals 2 mm. long, obtuse; petals 4 mm. long, acutish; carpels described as erect.

TYPE LOCALITY: On hillside near Cusihuiriachic, Chihuahua, Mexico.
DISTRIBUTION: Only known from the original locality.

28. **Sedum minimum** Rose, Bull. N. Y. Bot. Gard. 3: 40. 1903.

Sedum Pringlei minus Rob. & Seaton, Proc. Am. Acad. 28: 105. 1893. Not *S. minus* Haw. 1825.

Delicate perennial, about 2 cm. high, arising from small globose tubers. Leaves oval-oblong, obtuse, 4 mm. long; calyx-lobes 3–3.5 mm. long, linear, free at base; petals distinct, violet (?), longer than the calyx; filaments 10, only 5 anther-bearing; scales linear, 0.6 mm. long, obtuse or retuse; carpels united for one-third their length; styles very short.

TYPE LOCALITY: Summit of the Nevada de Toluca, State of Mexico.
DISTRIBUTION: Known only from the type locality.

29. **Sedum australe** Rose, Bull. N. Y. Bot. Gard. 3: 41. 1903.

Perennial, procumbent, rooting at the joints; branches woody, tuberculately roughened. Leaves numerous, densely crowded, terete, obtuse, 6–7 mm. long, glabrous; inflorescence a short compact cyme; calyx-lobes leaf-like, half as long as the petals; petals reddish-yellow, 7 mm. long, mucronate on the back below the apex; carpels widely spreading when mature.

TYPE LOCALITY: Volcano of Santa Maria, Guatemala.
DISTRIBUTION: Known only from the type locality.

30. **Sedum Douglasii** Hook. Fl. Bor. Am. 1: 228. 1832.

Sedum uniflorum Howell, Fl. N. W. Am. 213. 1898. Not *S. uniflorum* H. & A.

Perennial by a branching rootstock; stems erect or ascending, simple, or branched near the base, 1–2.5 dm. high. Leaves linear-lanceolate to narrowly lanceolate, acuminate, sessile, glabrous, 10–25 mm. long, flat above, usually with short leafy shoots in the axils; cyme usually several-forked, sometimes 6 cm. broad, sometimes reduced to a single flower; flowers short-pedicelled or subsessile; calyx-segments triangular-ovate to triangular-lanceolate, acuminate, much shorter than the petals; petals 6–12 mm. long, yellow, lanceolate, acuminate, longer than the stamens; follicles 3–4 mm. long, widely divergent from the slightly united bases.

TYPE LOCALITY: Rocky places of the Columbia River to the mountains.
DISTRIBUTION: Montana to British Columbia, Idaho and California.

31. **Sedum shastense** Britton, Bull. N. Y. Bot. Gard. 3: 41. 1903.

Perennial by a slender rootstock, glabrous; stems slender, erect, or the base decumbent, 6–12 cm. high. Leaves lanceolate to oblong-lanceolate, 10–15 mm. long, 3–5 mm. wide, acute, papillose, the narrowed base somewhat prolonged below the axil; cyme small, compact, 2–3 cm. broad; flowers few, sessile or nearly so; calyx-segments ovate to triangular-ovate, acute, about half as long as the petals; petals very thin, lanceolate, acuminate, yellow, strongly 1-nerved, about 8 mm. long, exceeding the stamens and pistils; styles subulate; young follicles erect.

TYPE LOCALITY: North side of Mt. Shasta, Siskiyou County, California.
DISTRIBUTION: Known only from the type locality.

32. **Sedum ciliosum** Howell, Fl. N.W. Am. 214. 1898.

Perennial by a short branching rootstock; stems rather slender, branched or simple; 5–12 cm. high. Leaves lanceolate, long-acuminate, 1–2 cm. long, 1.5–3 mm. wide near the base, ciliate-puberulent or the upper glabrous, veiny when dry, usually bearing leafy shoots in the axils; flowers sessile or short-pedicelled, in small compact cymes; calyx-segments ovate, long-acuminate, half as long as the lanceolate acuminate petals, which are 7–9 mm. long and somewhat exceed the stamens; carpels about 4 mm. long, subulate-tipped, divergent from their somewhat united bases.

TYPE LOCALITY: On rocks in the Coast mountains near Roseburg, Oregon.
DISTRIBUTION: Known only from the original locality.

33. **Sedum Cockerellii** Britton, Bull. N. Y. Bot. Gard. 3: 41. 1903.

Perennial, glabrous, branched, 2 dm. high or less. Basal leaves not seen; stem-leaves lanceolate to oblong-lanceolate, sessile, acute, 1–2.5 cm. long, 6 mm. wide or less; cymes

2–6 cm. broad; flowers subsessile; calyx-segments nearly linear, acute or acutish, a little shorter than the petals; petals linear-lanceolate to linear-oblanceolate, acute, 6–8 mm. long, white; anthers pink; carpels erect; styles subulate.

TYPE LOCALITY: Tuerto Mountain, east of Sante Fé, New Mexico.
DISTRIBUTION: Mountains of New Mexico.

34. **Sedum naviculare** Rose, Bull. N. Y. Bot. Gard. **3**: 42. 1903.

Annual; stems simple or branching at base, glabrous, purplish, 5–10 cm. long; basal leaves not seen. Stem-leaves scattered, "spatulate, concavo-convex," obtuse, glabrous, 2–10 mm. long; inflorescence of 2 or 3 more or less elongated, one-sided racemes; flowers scattered, subsessile or sometimes very distinctly pedicelled; sepals linear, nearly equal, green, 1.5–3 mm. long; petals free to the base, purplish, ovate-lanceolate, 4 mm. long, obtuse; stamens 10, all decidedly shorter than the petals, those opposite the petals attached to them above the base; anthers short, purple; scales 5, alternating with the sepals, very distinct, 0.6 mm. long, narrowly-club-shaped; follicles erect, glabrous.

TYPE LOCALITY: Sierra de Tepoxtlan, Morelos, Mexico.
DISTRIBUTION: Known only from the type locality.

35. **Sedum jaliscanum** S. Wats. Proc. Am. Acad. **25**: 148. 1890.

Annual, diffusely branching, glabrous, 5–10 cm. high. Leaves spatulate, 1–3 cm. long including the slender petiole, thin, obtuse; flowers solitary and axillary (forming a leafy equilateral raceme); pedicels short, 2 mm. long or less; sepals distinct, unequal, leaf-like, the longer ones 6 mm. long; petals white, 3 mm. long, linear-lanceolate, acuminate; anthers purplish; scales minute; carpels erect.

TYPE LOCALITY: Near Guadalajara, Jalisco, Mexico.
DISTRIBUTION: Jalisco.

36. **Sedum tortuosum** Hemsl. Diag. Pl. Nov. **1**: 10. 1878.

Perennial, shrubby, glabrous, the branches thick and tortuous. Leaves alternate, spatulate, flat, obtuse, 2.5 cm. long; inflorescence a small terminal cyme; pedicels short; sepals free, very unequal, oblong or obovate, obtuse; petals white (?) erect (?), lanceolate, acute, twice longer than the sepals.

TYPE LOCALITY: Mexico.
DISTRIBUTION: Known only from the type specimen.

37. **Sedum retusum** Hemsl. Diag. Pl. Nov. **3**: 51. 1880.

Shrubby, glabrous, but branches tuberculately roughened. Leaves sessile, oblong-obovate, or spatulate, often retuse, 1–1.5 cm. long; inflorescence a few-flowered cyme; sepals linear-oblong, 4 mm. long; petals oblong, acute, keeled on the back, 6 mm. long; carpels 8.

TYPE LOCALITY: San Luis Potosi, Mexico.
DISTRIBUTION: San Luis Potosi.

38. **Sedum tuberculatum** Rose, Contr. U. S. Nat. Herb. **5**: 143. 1897.

Perennial; stems herbaceous, perhaps woody below, branching and spreading at base, closely set with small red tubercles. Leaves spatulate, 6–12 mm. long, obtuse, alternate, glabrous; inflorescence a few-flowered cyme; pedicels very short or wanting; sepals 5, linear, 5 mm. long; petals white, 6–8 mm. long, mucronate on the back below the apex; carpels 5, widely spreading.

TYPE LOCALITY: Near the City of Oaxaca, Mexico.
DISTRIBUTION: Oaxaca.

39. **Sedum Conzattii** Rose, Bull. N. Y. Bot. Gard. **3**: 42. 1903.

More or less shrubby at base, 3–4 dm. high, branched, puberulent. Leaves alternate, spatulate, rounded or retuse at apex, 2–3 cm. long, thin; inflorescence a short cyme; sepals about 2 mm. long, free to base; petals white or purplish, 6 mm. long, acute; stamens shorter than the petals, anthers reddish; scales very small.

TYPE LOCALITY: Sierra de San Felipe, Oaxaca, Mexico.
DISTRIBUTION: Sierra de San Felipe.

40. **Sedum oxypetalum** H. B. K. Nov. Gen. & Sp. **6**: 45. 1823.

Bushy, about 1 m. high, much branched; stem 5 cm. in diameter or more, the epidermis somewhat roughened. Leaves flat, obovate-spatulate, 1–1.5 cm. long, rounded at apex, narrowed at base into a short petiole extending backward at insertion; inflorescence leafy, cymose; flowers sessile; sepals narrowly lanceolate, acute, 3 mm. long; petals linear-lanceolate, acuminate, purplish red; carpels 5, widely spreading in fruit.

TYPE LOCALITY: Mexican garden.
DISTRIBUTION: Central Mexico among high volcanic rocks.
A species of similar habit, but with narrow and acute lower leaves, occurs in central Mexico, where it was collected by Mr. Rose; it is doubtless undescribed, but the flowers are unknown.

41. **Sedum Botteri** Hemsl. Diag. Pl. Nov. **1**: 10. 1878.

Perennial; flowering stems 3 dm. high or less, very leafy. Leaves ovate-spatulate, 3–4 cm. long, 1–1.5 cm. wide, rounded at apex, cuneate at base, glabrous throughout; flowers cymose-paniculate, short-pedicelled; sepals linear, shorter than the yellow (?) corolla; scales described as broad.

TYPE LOCALITY: Orizaba, Mexico.
DISTRIBUTION: State of Vera Cruz, Mexico.

42. **Sedum Nelsoni** Rose, Bull. N. Y. Bot. Gard. **3**: 43. 1903.

Caulescent, branching, especially above, 1–1.5 dm. high; branches brownish and tuberculately roughened. Leaves (at least in herbarium specimens) thin and distinctly nerved, spatulate, 2.5–3.5 cm. long, 6–7 mm. broad at widest point, narrowed at base into a rather distinct petiole and extending below the point of attachment into a broad spur; inflorescence a few-flowered cyme; pedicels 4–5 mm. long; sepals distinct, unequal, the longer ones 8 mm. long; petals free (?) to the base, lanceolate, acute, yellowish but with a broad reddish stripe on the back; stamens opposite the petals borne high upon them, the others attached at or near their bases; carpels widely spreading from the very base.

TYPE LOCALITY: Between Ayusinapa and Petatlan, Guerrero, Mexico.
DISTRIBUTION: Known only from the type locality.

43. **Sedum Palmeri** S. Wats. Proc. Am. Acad. **17**: 355. 1882.

Perennial, caulescent, erect and branching, glabrous. Leaves thick, flattened, spatulate to obovate, 2.5–3.7 cm. long; inflorescence paniculate; pedicels short; petals 4–6 mm. long, deep-orange, narrowly lanceolate; carpels short, about as long as the slender styles.

TYPE LOCALITY: Guajuco, Nuevo Leon, Mexico.
DISTRIBUTION: Nuevo Leon and Coahuila.

44. **Sedum Purpusi** Rose, sp. nov.

Stems several dm. high, weak and much branched, glabrous. Leaves alternate, flat, green, 2–3 cm. long, oblanceolate, retuse at apex; inflorescence compact, paniculate, each branch arising from the axil of a leaf and ending in a 2–5-branched cyme; ultimate branches bearing 2–7 sessile flowers; calyx-teeth obtuse, unequal, the shorter ones as long as the tube, green, erect; petals weakly spreading, 5 mm. long, somewhat trough-shaped, obtuse, but with the faintest indications of a tooth just back of the apex, bright-yellow; stamens 10, the 5 opposite the sepals distinct to the base, the 5 opposite the petals borne on them a short distance above the base; scale thin and ribbon-like, truncate or nearly so; carpels distinct, lanceolate in outline, tapering into slender styles, at first erect but in age spreading.

On rock between Esperanza and Orizaba City, Vera Cruz, Mexico. Collected by C. A. Purpus 1904 (Rose *no. 942*, Purpus *no. 7*).

45. **Sedum dendroideum** Moç. & Sessé; DC. Mem. Crass. 37. *pl. 9*. 1828.

A shrub 1–3 dm. high, much branched, smooth. Leaves flat, fleshy, obovate or spatulate, rounded at apex, sessile, 2–4 cm. long, 1 cm. broad at top; inflorescence cymose-paniculate, 0.5–1.5 dm. long, 1 dm. broad or less; flowers sessile or nearly so; calyx 5-

lobed, the lobes ovate, 1.5–2 mm. long, obtuse; petals bright-yellow, lanceolate, acute, 5–6 mm. long, spreading; stamens 10; carpels 5, spreading in age, many-seeded.

TYPE LOCALITY: Mexico.
DISTRIBUTION: On cliffs, Central Mexico.
ILLUSTRATION: DC. Mem. Crass. *pl. 9.*

46. **Sedum confusum** Hemsl. Diag. Pl. Nov. **1**: 10. 1878.

Shrubby, 3–6 dm. high, glabrous, shining. Leaves sessile, obovate-spatulate, 18–25 mm. long, rounded at apex; inflorescence a congested cyme; flowers sessile, 8–10 mm. broad; calyx 5-lobed; petals obovate-lanceolate, yellow; scales minute.

TYPE LOCALITY: Mexico?
DISTRIBUTION: Only known from garden specimens supposed to have come from Mexico.
ILLUSTRATION: Baker in Saund. Ref. Bot. 5: *pl. 337.*

47. **Sedum praealtum** DC. Pl. Rar. Genèv. **10**: 21. 1847.

A shrub, 15–18 dm. high, branching, glabrous. Leaves oblanceolate-spatulate, obtuse or acutish, shining, 5–8 cm. long; inflorescence cymose-paniculate; pedicels short; calyx-lobes oblong-lanceolate, obtuse; petals yellow, narrowly lanceolate, acute, four times longer than the calyx-lobes; scales small, round; carpels subulate, many-seeded.

Described from garden specimens supposed to be of Mexican origin. A very doubtful species.

48. **Sedum ternatum** Michx. Fl. Bor. Am. **1**: 277. 1803.

Sedum portulacoides Willd. Enum. Hort. Berol. 484. 1809.
Sedum deficiens Donn, Hort. Cantab. ed. 6. 126. 1811.
Anacampseros ternata Haw. Syn. Pl. Succ. 114. 1812.
Sedum americanum Banks; Pursh, Fl. Am. Sept. 324, as synonym. 1814.
Sedum octogonum DC. Prodr. **3**: 403, as synonym. 1827.

Perennial by rootstocks, glabrous, tufted; stems creeping, flowering branches 0.7–2 dm. high. Lower leaves and those of sterile shoots flat, obovate, entire, 1–2.5 cm. long, sometimes 2 cm. wide, rounded at the apex, cuneate at the base or narrowed into a petiole, verticillate in 3's; upper leaves oblanceolate or oblong, alternate, sessile; cyme 2–4-forked, its branches spreading or recurved in flower; flowers rather distant, often leafy-bracted, about 1 cm. broad; petals linear-lanceolate, acute, nearly twice the length of the oblong obtuse sepals; follicles 5 mm. long, tipped with the slender style.

TYPE LOCALITY: On rocks, western Pennsylvania, Virginia and Carolina.
DISTRIBUTION: On rocks, New York and New Jersey to Georgia, Indiana, Michigan and Tennessee.
ILLUSTRATIONS: Bot. Reg. *pl. 142;* Bot. Mag. *pl. 1977;* Britt. & Brown, Ill. Fl. *f. 1818.*

49. **Sedum filiferum** S. Wats. Proc. Am. Acad. **21**: 428. 1886.

Perennial, glabrous, about 1 dm. high. Basal leaves in dense rosettes, spatulate, 8–16 mm. long, tapering at apex into a long filiform appendage; inflorescence an open cyme; pedicels 6–8 mm. long; sepals oblong, 4 mm. long, ending in a short seta; petals 8 mm. long, acute, white below, reddish above.

TYPE LOCALITY: Chihuahua.
DISTRIBUTION: Only known from specimens raised in Washington, D. C., from seed collected by Dr. E. Palmer in Chihuahua, Mexico.

50. **Sedum (?) longipes** Rose, Bull. N. Y. Bot. Gard. **3**: 43. 1903.

Stems slender, creeping, rooting at the joints. Sterile branches bearing dense rosettes of small orbicular leaves; flowering branches seemingly erect, 2–3 cm. high, flowering toward the top; flowers solitary in the axils of the leaves, 8–10 mm. long; sepals ovate, obtuse, 2–3 mm. long; petals purple, 4–5 mm. long, lanceolate, apparently keeled near the tip; scales (for the genus very conspicuous) strongly 2-lobed, each lobe with several teeth at apex; stamens 10, shorter than the petals.

TYPE LOCALITY: Mossy knobs of conglomerate of the Sierra de Tepoxtlan, Morelos, Mexico.
DISTRIBUTION: Known only from the type locality and vicinity.

51. **Sedum Lumholtzii** Rob. & Fern. Proc. Am. Acad. **30**: 116. 1894.

Probably perennial; stems herbaceous, puberulent, 1–2.5 dm. high. Basal leaves numerous, spatulate, 8–12 mm. long, obtuse, pubescent, flattened; inflorescence a flat-topped cyme; pedicels 2–6 mm. long; sepals united near the base, oblong, obtuse, 3 mm. long; petals white, 5 mm. long, acute; scales small; carpels somewhat spreading (?).

TYPE LOCALITY: Nacoi, Sonora, Mexico.
DISTRIBUTION: Only known from two stations in Sonora.

52. **Sedum Wootoni** Britton, Bull. N. Y. Bot. Gard. **3**: 44. 1903.

Rootstocks rather stout; stems tufted, slender, erect or ascending, 1–1.5 dm. high, granular-puberulent above, glabrous below. Leaves sessile, 8–14 mm. long, 2.5–5 mm. wide, the basal and lower ones obovate to spatulate, obtuse, the upper narrowly spatulate to linear-oblong, acute to acuminate; cyme 2.5–5 cm. broad, its branches densely granular-puberulent; pedicels 2 mm. long or less; sepals narrowly oblong, obtusish; petals white, oblanceolate, acute, longer than the sepals, 6–8 mm. long; carpels erect, subulate-tipped.

TYPE LOCALITY: Organ Mountains, New Mexico, 2,000 m. altitude.
DISTRIBUTION: Mountains of New Mexico and Arizona.

53. **Sedum puberulum** S. Wats. Proc. Am. Acad. **23**: 273. 1888.

Perennial, with numerous simple stems arising from the crown, 4–6 cm. high, rough-puberulent. Leaves sessile, flat, oblanceolate to spatulate, 7–10 mm. long, acutish; sepals narrowly oblong, 4–6 mm. long, puberulent; petals 6 mm. long, acute, white, a little longer than the sepals.

TYPE LOCALITY: Shaded cliffs in the Sierre Madre, Chihuahua, Mexico.
DISTRIBUTION: Known only from the type locality.

54. **Sedum Griffithsii** Rose, sp. nov.

Perennial, growing in clumps from somewhat thickened roots. Flowering stem about 10 cm. long; basal leaves decidedly flattened, rough on both sides, oblanceolate, 6–8 mm. long, obtuse; stem-leaves scattered, somewhat narrower than the basal leaves; inflorescence a rather compact cyme; flowers sessile or nearly so; sepals narrow, leaf-like, 5 mm. long; corolla 12 mm. broad, white, its lobes broadly ovate, widely spreading; glands purplish; carpels erect, at least at first; styles slender.

Common on the mountains of southern Arizona.
Santa Rita Mountains, D. Griffiths, October, 1903 (*no. 6061*, type); near Ft. Huachuca, T. E. Wilcox, September, 1894 (*no. 459*); Mt. Graham, J. T. Rothrock, 1874 (*no. 756*); Bowie, M. E. Jones, September 20, 1884.

55. **Sedum californicum** Britton, Bull. N. Y. Bot. Gard. **3**: 44. 1903.

Rootstock rather stout, nearly horizontal. Stems erect, stout, 1.5–2 dm. high; basal leaves and those of rosettes spatulate, obtuse, 1–3 cm. long, 8–10 mm. wide, the flabellately arranged veins uniting in an intramarginal nerve; stem-leaves linear-oblong to oblong-spatulate, acute to acutish, about 1 cm. long; cyme large, 6–10 cm. broad, its branches stout, ascending or somewhat recurved, mostly once or twice forked; flowers sessile or the lower ones on stout pedicels 3 mm. long or less; sepals ovate, acutish or obtuse, about 2 mm. long, one-fourth to one-third as long as the narrowly lanceolate, white, long-acuminate petals; carpels broad, divergent, finely reticulated, the subulate tips ascending.

TYPE LOCALITY: North side of Mount Shasta, Siskiyou County, California, 1,600–3,000 m. altitude.
DISTRIBUTION: Northern California.

56. **Sedum madrense** S. Wats. Proc. Am. Acad. **23**: 273. 1888.

Perennial, with a somewhat creeping rootstock, much branched, 1 dm. high, glabrous throughout, very leafy. Leaves narrow, obtuse, 6–8 mm. long; inflorescence cymose; sepals 4 mm. long, obtuse; petals purple, 6–7 mm. long; carpels strongyl spreading.

TYPE LOCALITY: Sierra Madre, Chihuahua, Mexico.
DISTRIBUTION: Only known from the type locality.

57. **Sedum Nevii** A. Gray, Man. ed. 5. 172. 1867.

Tufted, glabrous; stems spreading or decumbent, flowering branches ascending, 8–13 cm. high. Leaves of the sterile shoots densely imbricated, spatulate or obovate, narrowed or cuneate at the base, mostly sessile, rounded at the apex, entire, 6–12 mm. long; leaves of the flowering branches spatulate or linear-oblong, alternate; cyme about 3-forked; flowers close together, 6–8 mm. broad; petals linear, longer than the sepals; follicles about 4 mm. long, divergent, tipped with short styles.

TYPE LOCALITY: Mountains of Virginia to Alabama.
DISTRIBUTION: On rocks, mountains of Virginia to Alabama and Illinois.
ILLUSTRATION: Britt. & Brown, Ill. Fl. *f. 1819*.

58. **Sedum Wrightii** A. Gray, Pl. Wright. **1**: 76. 1852.

Perennial, glabrous; stems weak, decumbent, 2–5 dm. long or less, often with long branches. Basal and lower leaves ovate, obtuse, 6–10 mm. long, those of the inflorescence oblong to spatulate-oblong, much smaller; cymes compact; flowers very short-pedicelled, calyx-segments oblong, obtuse, half the length of the petals; petals spatulate to spatulate-obovate, obtuse or obtusish, apiculate, white tinged with rose, 6–8 mm. long, their tips spreading; follicles erect, a little shorter than the petals, tipped with the subulate styles.

TYPE LOCALITY: Hills near the San Pedro river, in crevices of rocks, and summits of mountains near El Paso, Texas.
DISTRIBUTION: New Mexico, western Texas, Chihuahua and Coahuila.

59. **Sedum pruinosum** Britton, sp. nov.

Plant white-pruinose; stem stout but weak, branched just above the base, 2 dm. long or less, the branches straggling, 1–1.5 dm. long. Leaves thick, blunt or slightly emarginate, not papillose-margined, the lower ones and those of rosettes broadly spatulate, 2–2.5 cm. long, about 1 cm. wide, narrowed into petioles, the upper ones oblanceolate, sessile, 1–1.5 cm. long, spreading or a little reflexed; cymes 6–8 cm. broad; pedicels stout, 1–3 mm. long; calyx very pruinose, about half as long as the petals, its lobes lanceolate, obtusish; petals bright-yellow, lanceolate, acuminate, 8–9 mm. long, 2–3 mm. wide, spreading; carpels erect, subulate-tipped.

Crescent City, California, Alice Eastwood, 1903.

60. **Sedum anomalum** Britton.

Gormania anomala Britton, Bull. N. Y. Bot. Gard. **3**: 30. 1903.

Stems decumbent or ascending, low; plant light-green, slightly pinkish-pruinose. Leaves of rosettes spatulate, 2 cm. long or less, apiculate, their margins slightly papillose; those of flowering stems oblong to oblanceolate, obtuse, sessile, 7–10 mm. long; cymes about 2.5 cm. broad; flowers very nearly sessile; calyx-lobes lanceolate, acutish, scarcely pruinose; petals lanceolate, acuminate, bright-yellow, 6–7 mm. long, 2 mm. wide, spreading, some of them often united at the very base; carpels erect, subulate-tipped.

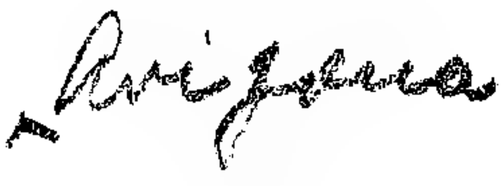
TYPE LOCALITY: San Luis Obispo County, California.
DISTRIBUTION: Southwestern California.

61. **Sedum spathulifolium** Hook. Fl. Bor. Am. **1**: 227. 1832.

Rootstocks slender; plant pale-green and somewhat glaucous; flowering stems ascending or spreading, simple, or sometimes branched, 1–2 dm. long, the base decumbent. Basal and lower leaves spatulate, 2.5 cm. long or less, blunt with a small acumination, the upper smaller and narrower; a line of pits near the margin on the under side; cyme 8 cm. broad or less, rather dense; pedicels 2–5 mm. long or less; calyx less than half as long as the petals, its segments lanceolate to oblong-lanceolate, obtuse, pruinose; corolla yellow, 8–10 mm. long, the petals lanceolate, acuminate, spreading or reflexed; carpels slightly divergent, subulate-tipped.

Plant with the habit of *Gormania*, but petals separate to the base.
TYPE LOCALITY: Dry rocky places of the Columbia and Salmon rivers.
DISTRIBUTION: British Columbia tocentral California.

Ave S. Mariæ medicamentum languentium
Praeparet, glorificet. Matt. 5. 5. 2 11



62. **Sedum yosemitense** Britton, Bull. N. Y. Bot. Gard. 3 : 44. 1903.

Perennial by rootstocks, very fleshy, stoloniferous. Basal leaves obovate-orbicular to broadly obovate, 1 cm. long or less, 6–9 mm. wide, rounded at the apex, green, not glaucous, or scarcely so; flowering stems 1–1.5 dm. high, slender, their leaves spatulate-obovate to oblong, obtuse, small; cyme compound, 5 cm. broad or less, rather densely flowered; pedicels stout, 0.5–2.5 mm. long; calyx deeply cleft, its lobes ovate-lanceolate, acute or acutish; petals light-yellow, lanceolate, acuminate, 6–8 mm. long, twice as long as the calyx or longer; follicles somewhat divergent, tipped with filiform styles.

TYPE LOCALITY: Between Vernal and Nevada Falls, Yosemite National Park, California.
DISTRIBUTION: Yosemite National Park.

63. **Sedum divergens** S. Wats. Proc. Am. Acad. **17** : 372. 1882.

Perennial by rather slender branched rootstocks, glabrous, 1.5 dm. high or less. Leaves obovate to orbicular-obovate, or the upper spatulate, obtuse, sessile, 5–8 mm. long, those of sterile shoots, or all of them, opposite; cymes rather compact, 5 cm. broad or less; flowers short-pedicelled; calyx-segments triangular-ovate, nearly as wide as long, acutish; petals lanceolate, acute, yellow, about 6 mm. long, three to four times as long as the calyx, about as long as the stamens; follicles shorter than the petals, united below, widely divergent, short-tipped.

TYPE LOCALITY: Cascade mountains, Washington.
DISTRIBUTION: Oregon, Washington and British Columbia.

64. **Sedum Leibergii** Britton.

Sedum divaricatum S. Wats. Proc. Am. Acad. **17**: 372. 1882. Not *S. divaricatum* Ait. 1789.

Perennial by rootstocks, glabrous, tufted, 2.5 dm. high or less; stems simple. Basal leaves and those of rosettes oblanceolate to obovate-spatulate, obtuse or acutish, 1–1.5 cm. long, those of the stem oblanceolate, those of the inflorescence oblong to lanceolate; cyme open, 5–10 cm. broad, its branches forked; flowers nearly or quite sessile; calyx-segments lanceolate to triangular-ovate, acute, much shorter than the petals; petals yellow, narrowly lanceolate, acuminate, 7–9 mm. long; follicles widely divergent from their united bases, subulate-tipped.

TYPE LOCALITY: Union County, Oregon.
DISTRIBUTION: Eastern Oregon and Washington and adjacent Idaho.

65. **Sedum Woodii** Britton, sp. nov.

Perennial by rootstocks or offsets, glabrous; flowering stems ridged, rather stout, about 1 dm. high. Basal leaves and those of rosettes very broadly spatulate, obtuse, 1.5 cm. long or less, 6–10 mm. wide, narrowed to a sessile base, those of the flowering stems alternate, narrowly spatulate or oblanceolate, 1 cm. long or less; cyme-branches 2-forked, 5–8 cm. long; flowers very nearly sessile; calyx-lobes lanceolate, acutish; petals yellow, lanceolate, acuminate, about 8 mm. long; carpels spreading, acuminate, tipped by subulate styles.

Oregon City, Oregon, A. Wood, 1866.

66. **Sedum diversifolium** Rose, Bull. N. Y. Bot. Gard. 3 : 44. 1903.

Sterile branches short, with small ovate flattened pale roughened leaves. Flowering branches elongated, weak, glabrous, with scattered leaves; leaves 5–10 mm. long, turgid, somewhat curved backward, pale-green, smooth; flowers terminal, solitary, short-peduncled, inconspicuous; sepals 5, leaf-like, obtuse, 2–3 mm. long; petals pale-yellow, twice the length of the sepals, ovate, acute, or even apiculate; stamens 10, much shorter than the petals.

TYPE LOCALITY: State of Mexico, Mexico.
DISTRIBUTION: Several localities in the State of Mexico.

67. **Sedum stoloniferum** Gmel. Iter. 3 : 311. 1774.

Perennial, glabrous, rooting from the nodes of prostrate shoots. Flowering stems ascending or erect, 1 dm. long or more; leaves opposite, obovate-cuneate or rhombic,

crenate, obtuse, 2 cm. long or less, short-petioled or the upper sessile; branches of the cyme rather loosely flowered; flowers nearly sessile; sepals linear-oblong, acutish; petals lanceolate, acute, about 1 cm. long, pale rose-colored, twice as long as the calyx.

TYPE LOCALITY: Caucasus.
DISTRIBUTION: Cumberland, Maine; near Digby, Nova Scotia. Native of the Orient.
ILLUSTRATION: Gmel. *loc. cit. pl. 35, f. 2.*

68. **Sedum Fabaria** Koch, Syn. Fl. Germ. & Helv. 258. 1837.

Sedum Telephium Torr. Fl. N. Y. 1: 253. 1843. Not *S. Telephium* L. 1753.

Perennial; stems stout, tufted, glabrous and slightly glaucous, 3–5 dm. high. Leaves alternate, ovate to obovate, obtuse, 2–5 cm. long, coarsely dentate, the upper sessile, the lower larger; cyme dense, compound, 5–8 cm. broad; flowers 5–8 mm. broad; petals purple, twice as long as the ovate acute sepals; follicles about 4 mm. long, tipped with a short style.

TYPE LOCALITY: Babia Gora, Sudetic mountains.
DISTRIBUTION: In fields and along roads, Quebec and Ontario to Maryland and Michigan. Naturalized from Europe.
ILLUSTRATIONS: Fl. Deutsch. ed. 5, *pl. 2641;* Britt. & Brown, Ill. Fl. *f. 1811*, as *S. Telephium.*

69. **Sedum telephioides** Michx. Fl. Bor. Am. **1**: 277. 1803.

Anacampseros telephioides Haw. Syn. Pl. Succ. 112. 1812.

Similar to the preceding, but more slender, seldom over 2.5 dm. high, glaucous and purplish. Leaves oval or obovate, obtuse, coarsely dentate or entire, 2–5 cm. long, narrowed at the base; cyme dense, 5–10 cm. broad; flowers 6–8 mm. broad; petals pale-pink, much longer than the lanceolate sepals; follicles about 4 mm. long, tipped with a slender style.

TYPE LOCALITY: On high cliffs, North America.
DISTRIBUTION: On dry rocks, southern Pennsylvania to western New York, southern Indiana, North Carolina and Georgia.
ILLUSTRATION: Britt. & Brown, Ill. Fl. *f. 1812.*

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70. **Sedum Havardi** Rose, sp. nov.

Closely resembling *S. tuberculatum* and *S. retusum*, but apparently not shrubby, low and much branched at base. Stems covered with red tubercles; leaves flattened, 4–5 mm. long, obtuse; flowers few, clustered near the tops of the branches, sessile or nearly so; calyx very small, about 1 mm. long; petals narrow, 4 mm. long; carpels widely spreading.

Described from scanty material collected by V. Havard at foot of cliffs, Chicos Mountains, western Texas, August, 1883 (*no. 132*).

EXCLUDED AND DOUBTFUL SPECIES

SEDUM MEEHANI A. Gray, Proc. Am. Acad. **16**: 105. 1880. This plant, described as from Utah, is *S. hispanicum* L., a European species.

SEDUM MISERUM Lindl. Bot. Reg. **24**: Misc. 65. 1838. Said to have been raised from Mexican seed; unknown to us.

Family 3. **PENTHORACEAE**

By Per Axel Rydberg

Perennial herbs, with rootstocks and alternate leaves. Flowers perfect, in terminal cymes, secund on the spreading branches. Hypanthium scarcely developed. Sepals 5 or 6, greenish, distinct. Petals as many as the sepals, inconspicuous, greenish, or wanting. Stamens twice as many as the sepals, hypogynous; filaments filiform; anthers oblong, dehiscent by longitudinal slits. Gynoecium of 5 or 6 carpels united to the middle; styles short, and abruptly pointed; stigmas capitate. Ovules numerous in each carpel, on axial placentae. Fruit depressed, composed of 5 or 6 follicles, inserted obliquely on the pyramidal receptacle and united about half their length, each follicle circumscissile just above their union.

The family consists of only the following genus:

1. **PENTHORUM** (Gronov.) L. Sp. Pl. 432. 1753.

Characters of the family. The genus contains two species, natives of China and the Amur District, and the following.

Type species, *Penthorum sedoides* L.

1. **Penthorum sedoides** L. Sp. Pl. 432. 1753.

Penthorum circinale Salisb. Prodr. 308. 1796.

A bright-green weed-like plant, glabrous, or glandular-pubescent above. Stem 1–6 dm. high, simple and terete below, branched and angled above; leaves shining; petioles 0.5–2 cm. long; blades elliptic-lanceolate or elliptic, 3–15 cm. long, acuminate at both ends, finely serrate; cymes 2–3-branched, their branches 2–8 cm. long, spreading; flowers light-green; sepals triangular-ovate, 1.5 mm. long, acute; petals linear or linear-spatulate, usually wanting; fruit 4–5 mm. broad, each follicle tipped with a spreading beak.

Type locality: Virginia.
Distribution: New Brunswick to Florida, Texas and Minnesota.
Illustrations: Hill, Veg. Syst. **13**: *pl. 6*; Gaertn. Fruct. *pl. 65*; Lam. Ill. *pl. 390*; Baill. Hist. Pl. **3**: *f. 376, 377*; E. & P. Nat. Pfl. 3^{2a}: *f. 22*; Britt. & Brown, Ill. Fl. *f. 1821*.

Family 4. **PARNASSIACEAE**

By Per Axel Rydberg

Glabrous perennial herbs, with short rootstooks and in most species (in all ours) with scapiform stems. Leaves entire, mostly basal and petioled, the single cauline leaf or bract usually sessile. Scape usually 1-flowered. Hypanthium short and usually poorly developed. Sepals 5, imbricated. Petals 5, imbricated, white or pale-yellow, conspicuously veined, deciduous. Stamens 5, hypogynous or perigynous, alternate with the petals and with 5 clusters of more or less united staminodia which in our species are gland-bearing at the ends; filaments subulate; anthers introrse or subextrorse. Gynoecium of 3 or 4 united carpels; ovary superior to half-inferior, with 3 or 4 parietal placentae; style short or none; stigmas 3 or 4, over the placentae. Ovules numerous, anatropous. Capsule 1-celled, loculicidal at the apex, with 3 or 4 valves; Seeds numerous, winged; endosperm wanting; embryo straight.

The family consists only of the following genus:

1. **PARNASSIA** (Tourn.) L. Sp. Pl. 273. 1753.

Characters of the family. It contains about two dozen species growing in wet places in temperate and subarctic regions.

Type species, *Parnassia palustris* L.

Staminodia united below into an obovate scale, fringed above with the free portions of the filaments.
- Petals fimbriate on the sides, at least below.
  - Free portions of the staminodia very short and stout; leaf-blades reniform or cordate, usually broader than long.
    - Petals obovate, 5–nerved; staminodial scales with 5–9 lobes; sepals elliptic. 1. *P. fimbriata.*
    - Petals oblong, 3-nerved; staminodial scales with 3–5 lobes; sepals narrowly lanceolate. 2. *P. rivularis.*
  - Free portions of the staminodia long and filiform.
    - Leaf-blades ovate to reniform, long-petioled. 3. *P. intermedia.*
    - Leaf-blades oval, short-petioled. 4. *P. cirrata.*
- Petals entire, not fimbriate.
  - Petals 5–9-veined, usually exceeding the sepals; capsule less than twice as long as the sepals; bract some distance from the base.
    - Petals rounded-oval to suborbicular; bract small, inserted above the middle of the scape. 5. *P. californica.*
    - Petals elliptic to oval; bract rather ample, inserted at or below the middle of the scape.
      - Staminodia 7–15 in each fascicle; basal leaf-blades cordate or rounded at the base.
        - Petals nearly twice as long as the sepals; hypanthium inconspicuous; staminodia usually 9–15. 6. *P. palustris.*
        - Petals only slightly exceeding the sepals; hypanthium conspicuous, obconic, fully half as long as the sepals and nearly as broad as high; staminodia 7–9. 7. *P. montanensis.*
      - Staminodia 5–7 in each fascicle; basal leaf-blades acute at the base. 8. *P. parviflora.*
  - Petals 3-veined, thin, scarcely equaling the sepals; capsule twice as long as the sepals; bract none or near the base. 9. *P. Kotzebuei.*

Staminodia 3–5 in each fascicle, nearly free, not forming an obovate scale below; petals entire.
- Petals sessile; basal leaf-blades from orbicular or cordate to elliptic.
  - Staminodia much longer than the stamens.
    - Petals elliptic to oval, 5–7-veined: anthers acute. 10. *P. grandifolia.*
    - Petals rounded oval, irregularly many-veined; anthers obtuse. 11. *P. floridana.*
  - Staminodia not longer than the stamens. 12. *P. caroliniana.*
- Petals clawed; basal leaf-blades reniform; staminodia not exceeding the stamens. 13. *P. asarifolia.*

1. **Parnassia fimbriata** Konig, Ann. Bot. **1**: 391. 1804.

Rootstock short, ascending. Petioles of the basal leaves 5–15 cm. long; blades reniform or broadly cordate, 2–4 cm. wide, thin, glabrous, with about 7 principal veins; scape 2–3 dm. high; bract cordate, more or less clasping, inserted at or above the middle of the scape; sepals 5–6 mm. long, elliptic or oval, obtuse, and often crenulate at the apex, with about 5 principal nerves; petals obovate, contracted below into a more or less distinct claw, fimbriate on the margins, with about 5 principal veins; filaments filiform, 7–8 mm. long; anthers ovoid; staminodia united into 5 fleshy obovate scales with 5–9 short lobes; capsule 1 cm. long or more, ellipsoid, 4-valved.

TYPE LOCALITY: North-west coast of America.
DISTRIBUTION: In springy places in the mountains, Alberta to Colorado, northern California and Alaska.
ILLUSTRATION: Hook. Bot. Misc. *pl. 23.*

2. **Parnassia rivularis** G. E. Osterhout, sp. nov.

Rootstock slender, erect. Petioles of the basal leaves 2–4 cm. long, slender; blades reniform or broadly cordate, thin, about 7-ribbed, 1–2 cm. wide; scape slender, about 1 dm. high; bract 5 mm. long or less, ovate, sessile, borne above the middle of the scape; sepals narrowly lanceolate, acute, about 3 mm. long; petals oblong, about 6 mm. long, 3-veined, contracted below and fimbriate-margined; staminodial scales with usually 3, seldom 5, short lobes; filaments filiform, 4–5 mm. long; capsule ovoid, 4-valved.

North Park, Colorado, on the border of Wyoming (*Osterhout 1778*).

3. **Parnassia intermedia** Rydb. sp. nov.

Parnassia fimbriata S. Wats. Bot. King's Exp. 97, in part. 1871. Not *P. fimbriata* Konig.

Rootstock short and erect. Petioles of the basal leaves rather stout, 5–8 cm. long; blades broadly ovate to reniform, some subcordate at the base, 1.5–3 cm. wide, 1.5–4 cm. long; scape 3–4 dm. high; bract ovate, sessile, borne slightly above the middle of the scape; sepals elliptic, about 6 mm. long, 5–7-nerved; petals about 1 cm. long, elliptic to obovate, fimbriate-margined below, with about 5 principal veins; filaments filiform-subulate, 6–7 mm. long; staminodial scales with 7–9 filiform gland-tipped filaments about 2 mm. long; capsule 4-valved, not seen fully mature.

Type from East Humboldt Mountains, Nevada (*S. Watson 370*, in part).
DISTRIBUTION: Nevada and Oregon.

4. **Parnassia cirrata** Piper, Erythea **7**: 128. 1899.

Parnassia fimbriata A. Gray, Bot. Calif. 1: 202, in part. 1876. Not *P. fimbriata* Konig.

Rootstock short, ascending. Petioles of the basal leaves 2–5 cm. long; blades ovate or lance-ovate, obtuse or acute, tapering at the base, 1–2 cm. long; scape 2–4 dm. high; bract 5–10 mm. long, lance-ovate to lance-linear; sepals oblong-lanceolate or lanceolate, obtuse, about 7 mm. long; petals oblong-obovate, 1 cm. long, fimbriate below with long hairs; staminodial scales with about 12 slender filiform filaments; capsule ovoid, 1 cm. long, 4-valved.

TYPE LOCALITY: Mt. San Bernardino, California.
DISTRIBUTION: In wet places in the mountains from the San Bernardino Mountains to the Upper Sacramento.

5. **Parnassia californica** (A. Gray) Greene, Pittonia **2**: 102. 1890.

Parnassia palustris californica A. Gray, Bot. Calif. 1: 202. 1876.

Rootstock short, ascending. Petioles of basal leaves 2–6 cm. long; blades broadly ovate, cuneate at the base, 2–4 cm. long, with 5–7 principal veins; scape 3–6 dm. high; bract small, ovate, 5–10 mm. long, sessile above the middle of the scape, or wanting; sepals oval to oblong, 4–6 mm. long, obtuse; petals rounded-oval to suborbicular, 5–7-veined, 10–15 mm. long; staminodial scales with 15–24 capillary filaments; filaments subulate, about 8 mm. long.

TYPE LOCALITY: Wet places in the Sierra Nevada, California.
DISTRIBUTION: Central California to southern Oregon.

Parmelia Tenuirenula Ro Lindau, Proc. Nat. Acc. Nat. Hist. 31: 266. 1904
= *Parmelia mexicana* Rose, Proc. U. S. Nat. Mus. 29: 438, 1905—

6. **Parnassia palustris** L. Sp. Pl. 273. 1753.

Rootstock short, erect. Petioles of basal leaves 1–6 cm. long; blades cordate, 1–3 cm. wide; scape 1–3 dm. high; bract ample, often as large as the basal leaves, ovate or cordate, more or less clasping, inserted at or usually below the middle of the scape; sepals oblong or elliptic, 4–6 mm. long; petals oval, 8–12 mm. long, with 5–9 principal veins; filaments subulate, 4–6 mm. long; staminodial scales with 9–15 filiform filaments; capsule ovoid, about 1 cm. long, 4-valved.

TYPE LOCALITY: Europe.

DISTRIBUTION: Labrador to Quebec, Michigan, Minnesota, Wyoming and Alaska; also in Europe and northern Asia.

ILLUSTRATIONS: Fl. Dan. *pl. 584;* Sv. Bot. *pl. 172;* Engl. Bot. *pl. 82;* Baxter, Brit. Bot. *pl. 70;* Fl. Deutsch. ed. 5, *pl. 139;* Britt. & Brown, Ill. Fl. *f. 1855.*

Parnassia palustris tenuis Wahl. Fl. Lapp. 74. 1812. A small variety, 1 dm. high or less, with small leaves and flowers, the petals being about 8 mm. long. Arctic America and Scandinavia.

7. **Parnassia montanensis** Fernald & Rydb. sp. nov.

Rootstock short and erect. Petioles of basal leaves 1.5–4 cm. long; blades ovate with a subcordate or rounded base, 1–2 cm. long, 8–18 mm. wide; scape about 2 dm. high; bract ample, ovate, subamplexicaul and subcordate at the base, borne below the middle of the scape; hypanthium obconic, fully half as long as the sepals and nearly as wide as high; sepals oblong to lanceolate, acute, 7–9 mm. long, 7–9-veined; petals oval to elliptic, only slightly exceeding the sepals, with 5–7 veins; filaments subulate, about 5 mm. long; staminodial scales with 7–9 gland-tipped filaments; capsule rounded-ovoid, about 1 cm. long, 4-valved.

Type from Sixteen-mile Creek, Montana, July 12, 1883 (*F. L. Scribner 54*).

DISTRIBUTION: Wet river-banks, Montana and Alberta.

8. **Parnassia parviflora** DC. Prodr. **1**: 320. 1824.

Rootstock short, erect. Petioles of basal leaves 1–5 cm. long; blades oval or ovate, narrowed at the base, 1–3 cm. long, 0.75–2 cm. wide; scape slender, 1–3 dm. high; bract ovate, sessile below the middle of the scape; sepals oblong, 5–8 mm. long; petals elliptic or oval, sessile, entire, 6–10 mm. long, 5–7-nerved; filaments subulate, 7–8 mm. long; staminodial scales with 5–7 filiform filaments; capsule ovoid, about 1 cm. long.

TYPE LOCALITY: North America.

DISTRIBUTION: Labrador to Quebec, South Dakota, Colorado, Utah and Athabasca.

ILLUSTRATIONS: Hook. Fl. Bor. Am. *pl. 27, f. B;* Britt. & Brown, Ill. Fl. *f. 1856.*

9. **Parnassia Kotzebuei** Cham.; Spreng. Syst. **1**: 951. 1825.

Rootstock very short, erect. Petioles of the basal leaves 1–2 cm. long or less; blades broadly ovate or somewhat cordate, 1–2 cm. long; scape slender, about 1 dm. (seldom 2 dm.) high; bract none, or inserted very close to the base of the scape; filaments subulate, about 2.5 mm. long; staminodial scales short, with 3–5 filiform short filaments; sepals oblong, 3-veined, 5–7 mm. long, equaling or exceeding the elliptic or oval 3-veined petals; capsule ovoid, about 12 mm. long and about twice as long as the petals.

TYPE LOCALITY: On Eschscholtz's Bay, near the Arctic Circle, northwestern America.

DISTRIBUTION: Greenland and Labrador to Quebec, Alberta, Wyoming, Alaska and the Arctic coast; also northeastern Asia.

ILLUSTRATIONS: Fl. Dan. *pl. 2286;* Hook. Fl. Bor. Am. *pl. 28;* Britt. & Brown, Ill. Fl. *f. 1854*

10. **Parnassia grandifolia** DC. Prodr. **1**: 320. 1824.

Parnassia caroliniana β Hook. Jour. Bot. **1**: 194. 1834.
Parnassia grandiflora Raf. Aut. Bot. 41. 1840.

Rootstock short, erect or ascending. Petioles of basal leaves 3–15 cm. long; blades thick and firm, round, oval or ovate, usually subcordate at the base, 3–10 cm. long, 2–8 cm. wide; bract ovate to reniform, usually borne below the middle of the scape; sepals oval or elliptic, 4–5 mm. long, 3–7-veined; petals elliptic to oval, 15–20 mm. long, with about 7 strong veins; filaments 7–8 mm. long, subulate; anthers ovate, acute, about 3 mm.

long; staminodia nearly filiform, 12–15 mm. long, 3–5 in each set, united only at the base; capsule ovoid, about 1.5 cm. long, 4-valved.

TYPE LOCALITY: North America, in the Cherokee Country (probably in North Carolina).
DISTRIBUTION: Virginia to Missouri, Louisiana and Florida.
ILLUSTRATION: Britt. & Brown, Ill. Fl. *f. 1853.*

11. **Parnassia floridana** Rydb. sp. nov.

Rootstock horizontal. Petioles of the basal leaves 2–10 cm. long; blades thick, cordate-ovate, 2–5 cm. long, 1.5–4 cm. wide; scape about 3 dm. high; bract cordate, clasping, inserted below the middle of the scape; sepals linear-oblong, faintly 5-veined; petals broadly oval, about 15 mm. long, prominently and rather irregularly veined with more than 10 principal veins; filaments subulate, 5–7 mm. long; staminodia filiform, 12–15 mm. long, united only at the base, usually 3 in each set; anthers broadly ellipsoid, obtuse, slightly over 2 mm. long.

Appalachicola, Florida (*Chapman*).

12. **Parnassia caroliniana** Michx. Fl. Bor. Am. 1: 184. 1803.

Parnassia americana Muhl. Cat. 32. 1813.
Parnassia ovata Muhl. Cat. ed. 2. 32. 1818. Not *P. ovata* Ledeb. 1813.
Parnassia ovata Belvisii DC. Prodr. 1: 320. 1824.
Parnassia rotundifolia Raf. Aut. Bot. 41. 1840.
Parnassia glauca Raf. *loc. cit.* 42. 1840.
Parnassia repanda Raf. *loc. cit.* 1840.

Rootstock very short, erect. Petioles of basal leaves 1–10 cm. long; blades ovate, broadly oval or nearly orbicular, sometimes subcordate at the base, rather thick and firm, paler beneath than above, 7–9-veined, 1.5–6 cm. long, 1–5 cm. wide; bract ovate, sessile, borne on the lower part of the scape; sepals elliptic, obtuse, 4–5 mm. long, 3-veined; petals broadly oval to elliptic-ovate, with about 9 strong veins, 10–18 mm. long; filaments subulate, 5–6 mm. long; anthers ovate, 2 mm. long; staminodia subulate, 3 (rarely 4–5) in each set, only slightly united below, a little shorter than the stamens; capsule ovoid, 4-valved, 8–10 mm. long.

TYPE LOCALITY: Carolina.
DISTRIBUTION: New Brunswick to Manitoba, South Dakota, Illinois, Virginia and Carolina (?).
ILLUSTRATIONS: Bot. Mag. *pl. 1459;* Torr. Fl. N. Y. *pl. 11;* Maund, Bot. Gard. *pl. 550;* Gray, Gen. Ill. *pl. 86;* Britt. & Brown, Ill. Fl. *f. 1852.*

13. **Parnassia asarifolia** Vent. Jard. Malm. *pl. 39.* 1804.

Parnassia nudata Raf. Aut. Bot. 41. 1840.

Rootstock short, thick, erect. Petioles of basal leaves 5–15 cm. long; blades reniform, 2–8 cm. wide, firm; scape 2–4 dm. high; bract reniform, clasping, inserted near the middle of the scape; sepals broadly oval, about 5 mm. long, obtuse, about 5-veined; petals 12–18 mm. long, entire, contracted below into a claw, the blades broadly oval with many strong veins; filaments 7–10 mm. long, subulate; anthers ovate, 2.5–3 mm. long; staminodia slightly shorter than the stamens, usually 3 in each set, united only at the base; capsule ovoid, acute, fully 1 cm. long, 4-valved.

TYPE LOCALITY: North America.
DISTRIBUTION: In the mountains, Virginia to South Carolina and West Virginia.
ILLUSTRATIONS: Vent. Jard. Malm. *loc. cit.;* Britt. & Brown, Ill. Fl. *f. 1857.*

PRESS OF
THE NEW ERA PRINTING COMPANY
LANCASTER, PA.